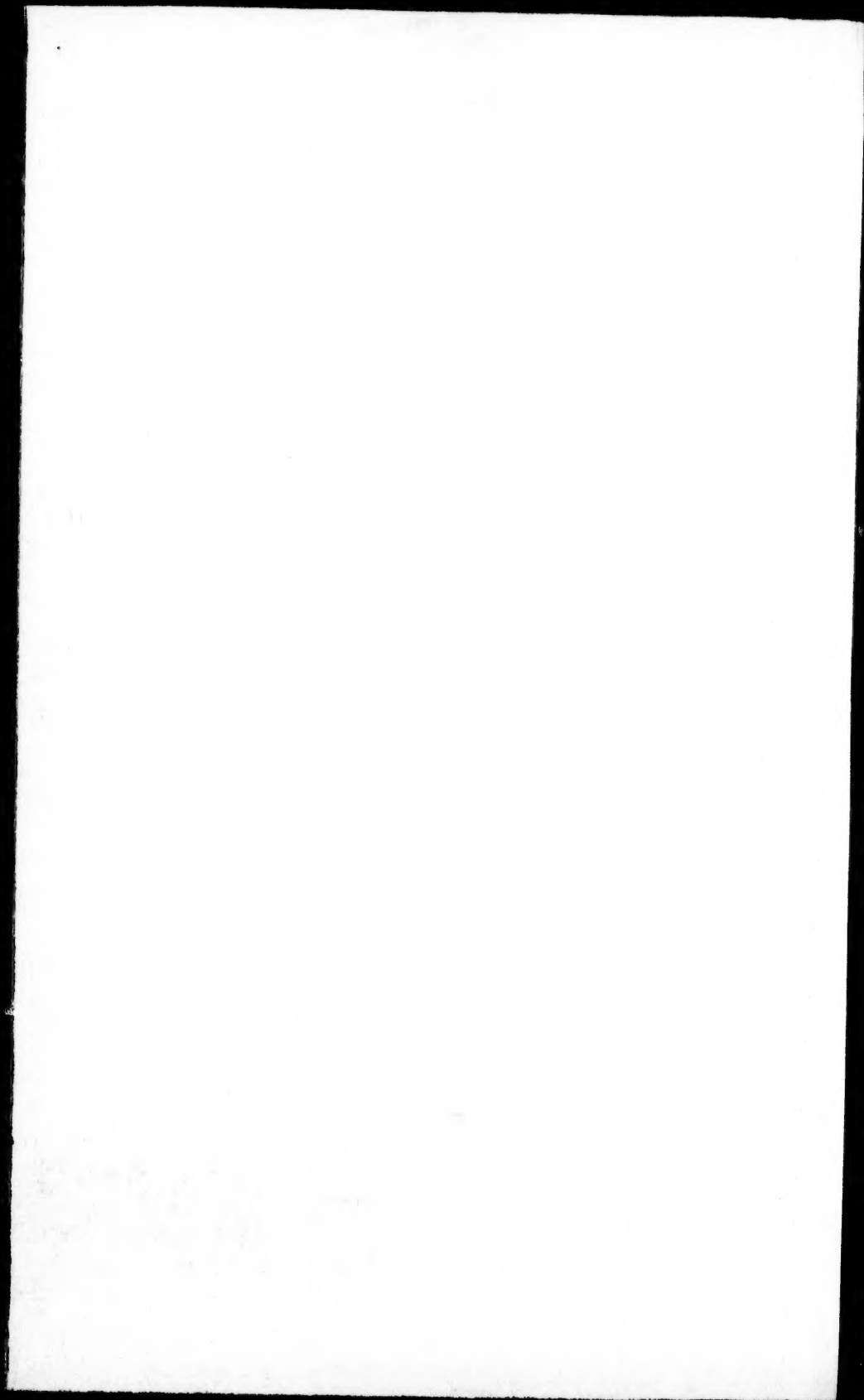




THREE YEARS IN CANADA:
AN ACCOUNT
OF THE
ACTUAL STATE OF THE COUNTRY
IN 1826-7-8.
COMPREHENDING
ITS RESOURCES, PRODUCTIONS,
IMPROVEMENTS, AND CAPABILITIES;
AND INCLUDING
SKETCHES OF THE STATE OF SOCIETY,
ADVICE TO EMIGRANTS, &c.

BY JOHN MACTAGGART,
CIVIL ENGINEER, IN THE SERVICE OF THE BRITISH GOVERNMENT.

IN TWO VOLUMES.

VOL. I.

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HENRY COLBURN, NEW BURLINGTON STREET.
1829.

285658

Mc TAGGART, J.

LONDON:
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Dorset Street, Fleet Street.

PREFACE.

THE great and growing interests of the Canadas, and the readiness shown by Great Britain to promote the advancement and prosperity of a country of such extent and importance, must render any account of its actual state, at the present moment, highly desirable. The encouragement given to emigrants to settle at such a distance from their native land; the magnitude of the improvements at present in active operation; and the imperfect knowledge we have hitherto possessed of the internal resources, productions, and capabilities of one of the most valuable of our colonies—have excited a very lively curiosity in the public mind for any new particulars on these interesting points, on the truth of which the fullest reliance may be placed.

Having obtained, from personal observation and experience, the most minute and accurate informa-

tion on a variety of subjects almost entirely unknown, I have considered it a duty which I owe to my countrymen, to lay before them the results of my investigations.

Early in the year 1826, Mr. Rennie was requested by Government to furnish a Clerk of Works to the Rideau Canal, in Upper Canada, then about to be commenced, and proposed to extend between the Ottawa River and Lake Ontario, a distance of 160 miles, through an uncleared wilderness. Being selected as a proper person to fill this situation, I undertook the arduous duties attached to it, and immediately proceeded to the active scene of operations.

Having zealously pursued my avocations, the nature of which will be found detailed in the work, my health began to suffer in the summer of 1828, from the malaria of the swampy wastes, to which I was necessarily much exposed. With a view to benefit by the change of climate, and to regulate other affairs, I returned to England at the close of last year.

The following extract, from an official letter,

PREFACE.

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may serve to show how far my humble exertions have been appreciated.

" Royal Engineers' Office, Rideau Canal,
5th August, 1828.

" SIR,

" I have the honour to state, for the information of his Lordship the Master-General, and Right Honourable and Honourable Board, that Mr. Mac-taggart, Clerk of Works at the Rideau Canal, is so much recovered of a dangerous fever, as to enable him to return to England according to order. And I beg leave to report, that I have found him a man of strong natural abilities, well grounded in the practical part of his profession, and a zealous, hard-working man in the field.

" I most respectfully recommend him to your protection and that of the Honourable Board. He is fond of research, and of exploring this untracked country; his reports are faithful, and I have always found him a man of honour and integrity.

" I have the honour to be, Sir;

Your most obedient humble servant,

(Signed) JOHN BY,

Lieut-Colonel Royal Engineers,
Commanding Rideau Canal."

" To General Mann,
Inspector-General of Fortifications,
Board of Ordnance."

In conclusion, I may be permitted to observe, that our possessions in North America embrace a large but ill-defined property, the nature of which we have yet failed to investigate, and respecting which the most erroneous ideas have been entertained. In proof of this assertion, the following letter, from the very first authority, may prove acceptable.

“ Glengarry, Upper Canada, 9th September, 1828.

“ SIR,

“ The warm zeal which you have displayed in forwarding the improvements of the Canadas since you have been at the head of the Colonial department, induces me to believe that it would not be unacceptable to you, Sir, to recommend the bearer, Mr. Mactaggart, to your notice, as, perhaps, the ablest practical engineer and geologist, and the properest person that has ever been in these Provinces for exploring the natural productions and latent resources of the country.

“ In recommending Mr. Mactaggart, I rely much more on the testimony of Colonel By, of the Royal Engineers, and other gentlemen of superior talents and science in those branches, who have spoken highly of him to me, than on my own judgment.

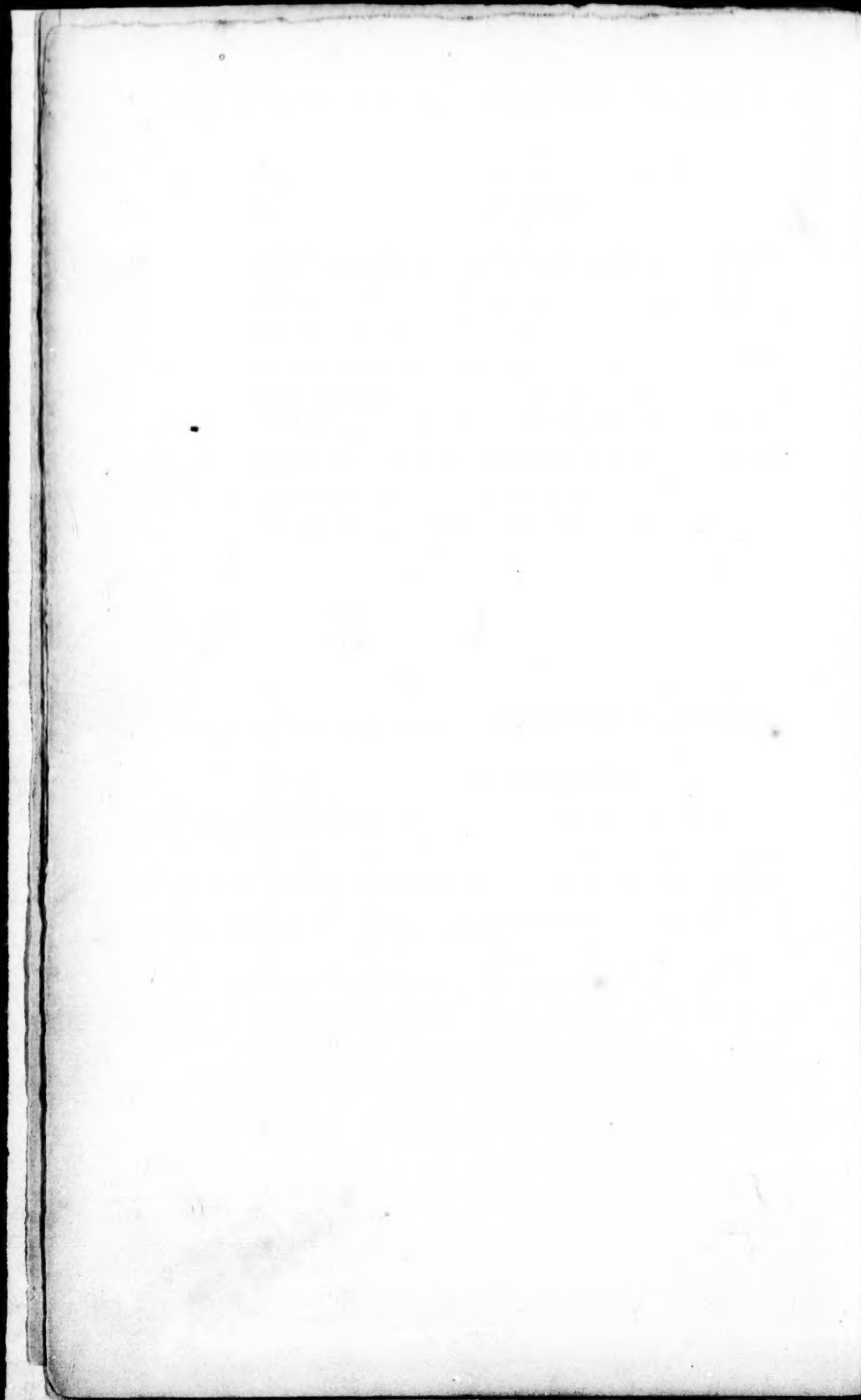
"From the knowledge which my own travels in the discharge of my pastoral duties, through this Province for thousands of miles annually, for the period of four-and-twenty years, enabled me to acquire, I have no hesitation in saying that very little more than the borders of some of the lakes have yet been explored, and that the inexhaustible resources and capabilities of these indeterminate forests remain yet to be discovered.

"I have the honour to be, Sir,

Your faithful and devoted servant,

(Signed) **ALEXANDER MACDONELL,**
Catholic Bishop of Upper Canada."

"To Lieut-General the Rt. Hon. Sir George Murray,
His Majesty's Principal Secretary of State
for the Colonies, &c. &c. &c."



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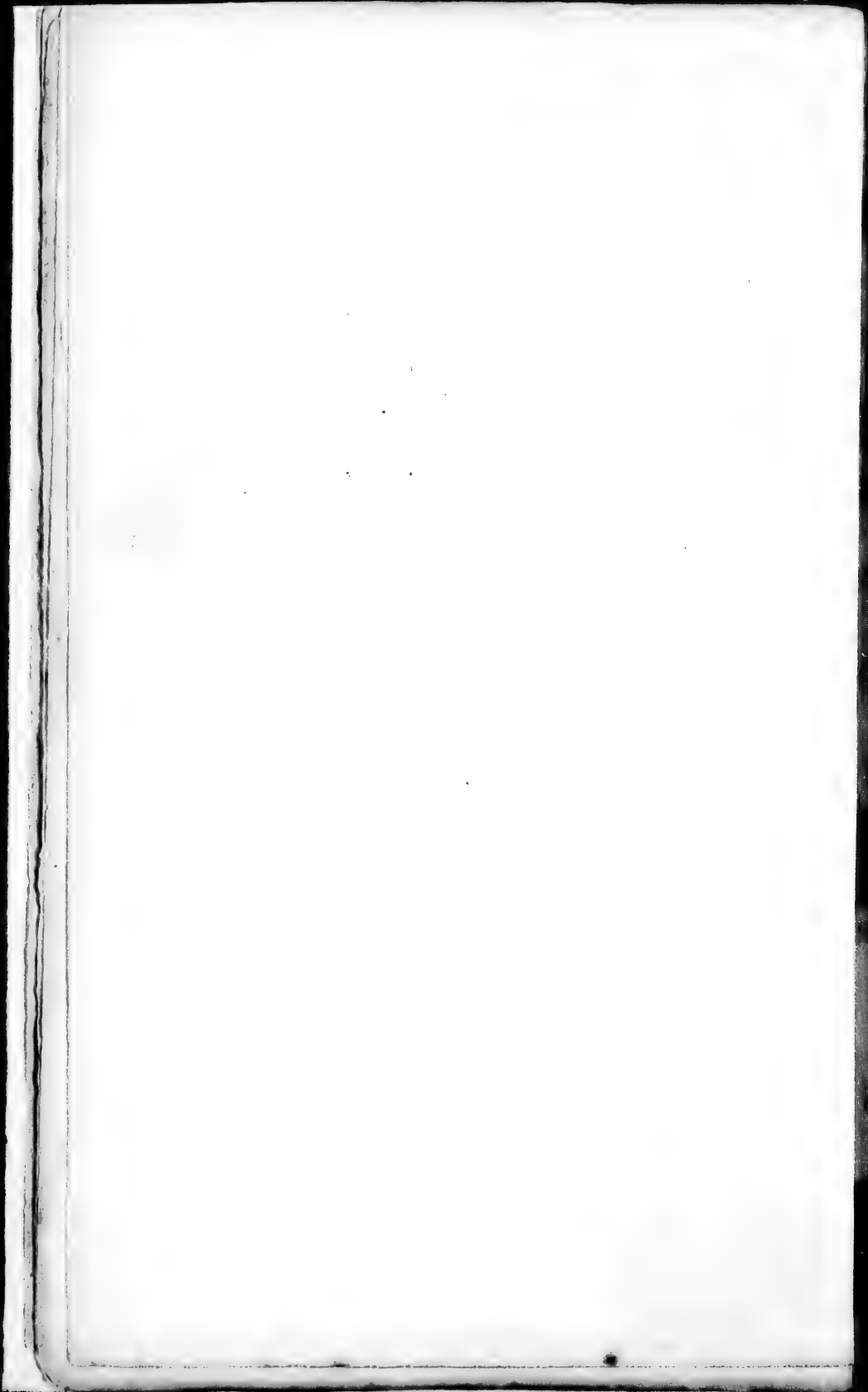
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THREE YEARS IN CANADA.

NOTES ON THE ATLANTIC.

BEFORE entering on subjects immediately relating to Canada, I may be allowed to make a few introductory remarks connected with that expanse of waters, which Europeans have to cross ere they can visit America. They are given as taken down on shipboard, without any touching up whatever ; as to do so might efface the rust contracted by coming in contact with the salt ocean,—which it may be better to avoid, in order to show things as they are. The best place in the world for composition is not always the academic grove, where all is quietness and harmony. Only on the deep can its scenes be faithfully depicted according to nature.

When quite out of soundings, the general appearance of the ocean becomes considerably altered,—the waves are much longer, while the hollows between seem extensive valleys. When an undulation bursts, the broken water spreads in froth over an extensive portion of the surrounding surface of the deep; and should the ship be where one of these bursts takes place, the surges and surf roar gloriously over the deck.

It is a singular thing to find dew falling on the ocean: not so plentiful indeed as on land, but still after a warm day it is found descending in the evening,—not to cool the tender herb certainly, but for some purpose, no doubt, which we have not yet discovered.

When about 600 miles west from the Land's-end of England, we were surrounded by a winged moth or butterfly in swarms, with ash-coloured wings. They kept bobbing and dancing about in the air, sometimes alighting on the smooth face of the deep, then starting up again. The weather for some time previous had been very warm. These insects must have been engendered in the ocean.

Before we were half-seas-over, we met with many American ships, seemingly bound for Europe. The sailors knew them by their mould,

method of painting, and form of sails. The name is often printed in large characters on the fore-topsail. They will not deviate from their course one yard in order to speak with any strange ship; their pride even in this respect is great. They are particularly fond of flashing their flag with its stars and stripes, when they have no notion of an enemy being near at hand; were such the case, the stars would be hauled down from the firmament, and something of a deceptive cast stuck up in their place.

The scenes of the sun rising and setting on a Midsummer ocean are beautiful. The nearer the face of the deep the glorious orb comes, the beams condense the more in the liquid mirror. What a blaze of radiance comes to eye, when the under-edge touches the horizon! which, from the decks of common merchant-ships, is about five miles distant.

Much depends on the man at the helm for keeping a dry vessel. A bad steersman has her often shipping seas; he does not know how to meet her, as the sailors say, — that is, to humour her with the helm. The sailors will sometimes *yaw* the ship for fun, when the passengers are walking the deck, and the surges will come lashing over them; but if grog has been given

them now and then, the poor fellows will never play this trick.

Persons who have never been at sea, fancy that the wooden crib for the bed is too narrow in dimension; but when the ship begins to roll and toss amongst the billows, they soon find the error of the supposition. Were the beds not of circumscribed width, they would be tumbled about from one side to the other, and very likely hove out altogether. Many have their beds widened in harbour, but are glad to reverse matters again on the ocean.

Strangers soon become acquainted with each other; for the natural disposition will show itself there sooner than any where else. How pleasant a voyage is, when a few good-hearted, sensible creatures meet together; and how disagreeable, when they are otherwise, as they most commonly are. He who has had what some will term comforts ashore, finds them not aboard;—then the poor wretch frets himself to death; while the wanderer, who has *roughed out life* in many a dismal climate, laughs at such trifles. Females are always our best companions both on sea and land: although they may be more troubled with sickness in ships than we, still the soft-soothing remark, the resigned state, and

sometimes cheerful smile, counterbalance that. The ladies often make cowards of us there; they brave storms with fortitude, at which we tremble.

Fogs off Newfoundland Banks generally arise with a little westerly breeze. They are extremely dense; so much so, that the bowsprit of the ship cannot be seen from the quarter-deck. While the fog continues, the weather is very cold, and the thickest woollen clothes and mits that we have, are in request. Often it will not clear away for a month or six weeks after it comes on: such duration, however, is rare about Midsummer; in the spring and fall it is more common. Fog-horns are blown in the ships at intervals, night and day, so that they may not run foul of each other. Lights of any kind cannot be seen very far off; the sun is quite obscured, and about the summer solstice the day is nearly as dark as the night; in order to read, we must burn candles. The sailors argue that the fogs raise the sea,—that is, create a commotion in the waters. The cause of this is not known, nor the reason why the fogs prevail more on the Banks than elsewhere. The gulf-stream being of a warmer nature than the surrounding ocean, may have some effect, while its

exhalations are condensed by the cold westerly wind. The fog is not so thick immediately on the surface of the ocean, as it is about one hundred feet above it; hence lighthouses should not be built higher than this. Like the lamp of Humphry Davy, the flame of which keeps at a little distance from the wire immersed in it;—or, steam issuing from a tube is not resolved into smoky vapour the instant it leaves it, but at a small distance from the mouth: which may apply to the exhalations from the tepid waters of the Banks not being turned to fog by the cold wind immediately on the surface of the ocean. Those immense masses of vapour, called fog banks, often assume a singular appearance as to form and variety of colour, before they shroud the sun from the observer; the tints are quite different from those of the common clouds; the shades of black, blue, and red, are surprising.

To obtain the set of a current of the ocean, a pitchpot is let down by a rope probably one hundred fathoms long,—this anchors a small boat, as it were: the log is then hove, and whichever way it trends is taken by the compass, and velocity per hour by the sand-glass; currents being always considered to increase in velocity the nearer they run to the surface. This may be well exemplified

by setting coloured fluids in motion on the same inclined plane; those above outrun those below. The muddy-tinged floods of rivers also represent the truth in a natural point of view.

Complex machinery is a bad thing any where, but of all places it is worse at sea; many apparently valuable improvements on the land, when transported to the waves lose their effect. To manage any piece of mechanics well in a turbulent ocean, requires it to be made extremely simple.

Cod-fish are caught on the banks of Newfoundland by hook and line; one man can attend to four lines, although fishing in forty fathoms water: the bait is generally a piece of white pork. Thus, as the poet says,

“ They wind them up by barrellfulls,
To feed a hungry world.”

The greatest quantities are caught in the latitude of St. John's, Newfoundland. The fishermen change their fishing-ground with the season. The old cod-fish are lousy, and not good food, haunting deep banks. The fish are generally salted aboard the schooners, and dried on the shores of Newfoundland. This trade might be greatly improved, and better methods applied for procuring the fish; something after the trowling mode, and not by

chapsticks. The banks require the investigation of very able naturalists.

Numbers of various fish are met with in a voyage over the Atlantic. Porpoises gambol and plunge about the ships in shoals, while the sailors harpoon them beneath the bows. Sharks are often seen prowling round, with dorsal fins above the water, and sometimes will take the bait hung out for them astern : when the weather is extremely fine, the ocean unruffled and pure, they may be seen playing with the bait in the chambers of the deep—this is an interesting scene ; fain would they grasp it, yet are suspicious. Dog-fish play round it in the same manner, turning up the edges of their white bellies, while they munch at it with their singular cross-set mouths : they are much like the shark, but not so large : they bring forth their young alive ; after they have been caught, the pregnant females deliver themselves on the deck. It is said that the shark cannot suffer the smell of tobacco-smoke : he is not singular in this respect, for there are human beings who do not relish it either,—at least they pretend so. The Indians are aware of this fact, and dare not smoke while they are crossing the bays of the Gulf of St. Lawrence, or the river itself, lest they rouse the ire of the shark. They have a story of an Indian

and his squaw, who were crossing, but forgot the precaution regarding the tobacco-smoke: an infuriated shark, of enormous size, came whack against their canoe, and cut it in two with his tail, when the poor wretches were devoured by the monster. There may be some truth in this statement. Beating up the St. Lawrence, while the pilot, a Canadian, was relating the above story, an immense shark approached the ship, swimming with great swiftness, and was seen distinctly by all on the deck; the water frothed about him, and he seemed much in wrath at something, which was concluded to be the cloud of smoke issuing from the sailors' pipes. Small fish are often found squatting on his back, along the side of the fins, called pilot-fish. Where sharks, dog-fish, and other rapacious fish are met with, all else are rare; innocence flees the domain of the savage: sharks and salmon, tigers and sheep, hawks and linnets, all feel the instinct to keep as much out of one another's company as possible.

Whales, or what are called finners, are common about the Gulf; they will come up and blow so near alongside sometimes, that the spray from their nostrils will fall aboard the ship. When they throw their tails out of water, they take a deep dive, and are seen no more for that time.

Much oil might be obtained from them, if a method was found of playing the rocket-shot on them to advantage.

A species of porpoise, very large, called bottle-noses by the sailors, is also very plentiful. This fish is of a white colour in the river St. Lawrence: when they turn up above the surface, they resemble a wreath of snow. How they become white is not known, their natural colour being black; some think it is the water that effects this change, the same being fresh or brackish. The young ones are grey. Probably this is a fish of a different kind from either the porpoise or bottle-nose; the Canadian says, that he changes his skin by rubbing it off beneath the ice. It is to be regretted that they are rarely caught; and when that happens, there is seldom any body present who makes any inquiry about the matter.

Salmon and herrings are extremely plentiful in the Gulf, as also mackerel and halibut. Drying-houses should be built on this coast, where so much timber grows, and these valuable fish properly cured; and, were it wished that they should be smoke-dried with scented wood, the juniper, which gives the relish to the Westphalian hams, is here in abundance.

Birds are met with in great variety. How

many species of gull can there be? more than fifty have already been discovered. Some are almost white, others have black-tipped wings; again, black behind the head; black upper side of wings; black and white speckled; black breast, &c.: others with broad green bill; yellow narrow and black bill; brown tufted crest; black legs; yellow legs, &c. The gulls and wild ducks would form, if stuffed, a very interesting museum of themselves. The gulls of the middle Atlantic are quite different in plumage and bulk from those on the coasts. Those found out at sea, are in general very light, as if they did not there find food very plentiful, which is not unlikely. They are sometimes met with asleep in large flocks, "rocked on the billows" as the poet has it. They will follow in the wake of the ships, and are easily caught with hook and bait. The large herring-gull is quite common over all the American coast: he follows the herring shoals, and ever seems to be a substantial, well-fed bird. When fully out to sea, we fall in with the stormy petrels, better known by the name of Mother Carew's chickens: on the eve of a storm, they gather in to the wake of the ship in great numbers. Mother Carew was an old witch, it is said, good at raising the wind. These birds are about the size of the swallow,

How

only their tails are not so long ; with brown plumage, short bills, feet not webbed ; they keep on the wing—sometimes they let their little legs droop, and trip along the water with their wings extended, but at rest. They seem to be fond of any little crumbs of food that fall from the ships. The sailors will not shoot them on any account ; they pay them great respect, that their mother's wrath may not be roused. They gather about the ships in storms for this reason, that the ships afford them a kind of shelter from the surge and spray, and also a little food ; they get weary of buffeting storms, like every thing else, and seem not to relish the spray lashing over them. Those birds that hover ever on wing close on the surface of the ocean, when it gets agitated, have more trouble, as it were, in watching the sudden undulations—in short, have more *ups* and *downs* to make. How these birds breed, has not been known ; they are not found on any shores, but over the expanse of the widest oceans—

“ Their home is on the deep.”

The sea parrot and pied diver, are met with on the margin of the banks of Newfoundland ; seldom any where else :—this diver is much like the puffin, only rather blacker in plumage. There

is also another sea-bird found with these, called the bank pigeon. Specimens of all are difficult to be obtained.

The white birds of the tropics, and sea eagles, hover about the ships; and when in soundings, either on one side of the Atlantic or the other, soland geese are met with. Sailors say, when a string of them are seen flying together, "that they are going out to the mackerel fishery." Sometimes they are met with near the middle of the ocean; it is not always the fact, as argued, that they are never found "out of soundings:" they are a shy bird, and keep well out of the reach of fire-arms.

Icebergs are met with aground on the Banks at Midsummer: I saw one at rest in seventy fathoms water, and taking its altitude, found one of the peaks one hundred and fifty feet above water: which nearly corresponds with the reports of Arctic voyagers, that two-thirds of them are below, while one-third is above. Had this iceberg been afloat, the truth of the proposition could not have been so easily obtained; but sounding gave the depth below, while the angle of altitude and distance gave the height above. It caused the atmosphere around to be very cold. The appearance was not unlike the chalk cliffs of the south of England at

a distance ; when the sun shone on it, the scene was beautiful ; the regions above were illuminated at night to a certain extent. Various fish kept swarming about. Ships are not allowed to run near them, as the attractive power is considered to be great by the sailors. They go ashore on them frequently with the boats and bring off fresh water, streams of which are found flowing down their sides ; they have often relieved ships in distress for this article. There are currents setting from the north, else how would icebergs drift into southern latitudes ?—perhaps eddies of the Gulf stream. A bird was flying about it of the diver species, called willock by the sailors.

The depth of the ocean has amused spectators ; it is likely as deep in some places as the mountains are high above. Fish are not suspected to be found on the bottom everywhere, no more than birds in the higher regions of the atmosphere ; beyond a certain depth darkness reigns, and life is considered extinct. Many laden ships which founder at sea, do not sink to the bottom ; but so far towards it as specific gravity will let, and no farther. “ How deep will a cast-iron box sink in the

ocean, twenty tons in weight, and inclosing a cubic yard of air?"

The ocean may be considered the best place for burial; that is, a sufficient weight may be hung to a dead body to sink it beyond the reach of all voracious fish, where no shark can follow,—this is a consolation to the friends of the deceased,—and also where no resurrectionists of earth can disturb him; from thence he cannot be served to the dissection-table. Admirals, and other great men who die at sea, are seldom thrown overboard, but brought home preserved in casks of spirits, the which are not unfrequently tapped by the sailors:—all this is wrong, for no family-vault can equal the sepulchre of the deep; there, no monument can be raised, no false epitaph engraved. What would be said in an obituary, might run thus: "Buried in such a latitude and longitude, having a sinking weight attached of ten miles deep." Common sailors, with a shot at their feet, never sink above half a mile.

Sailors are ever taking *observations* of something or other: about meridian time, or a little before it, they try for the altitude of the sun with Hadley's quadrant. The captains have generally sextants, mates inferior instruments. So long as the sun keeps rising, the index is advanced on

the rhomb; when his reflected form lingers on the horizon, he is said to dip. There is much art required to use the sextant properly. When there are clear skies and moonlight nights, lunars are taken. This is the art of measuring the degrees between sun and moon, or between known stars and the moon; which being obtained, and referred to the tables of the nautical almanack, give (as well known to many) the longitude. Latitude they find, too, by taking double altitudes of the sun or stars; that is to say, when clouds clear away, the latitude may always be had either by night or day. Not so the longitude, if the moon is changing, unless a good Harrison be aboard, which is a chronometer, and its rates of going be properly ascertained. On the Banks, the soundings tell where the ship is by the chart; and when in the Gulf stream, the green bunchy weed, called the gulf weed.

Common merchant-ships are sailing well at seven knots or miles an hour; few of them with the strongest wind will go ten. In storms, they dare not run before the wind, for fear of the sea dashing in the dead-lights—which are the shutters of the cabin windows, and broaching too, as the term goes,—that is, sinking stern foremost. Feathery clouds and brassy skies betoken storms.

There is something terrific in sailing under bare poles ; man then feels his insignificance strongly.

If the breeze blows fresh off the Canadian continent, the smell of fir forests prevails for fifty miles and more out at sea. Small birds that live by insects, such as the brown fly-catcher, about the size of a sparrow, hover about the ships ; and large dragon-flies, with eyes composed of many minute sparkling stars. These may be easily caught and examined.

The nautilus, or Portuguese man-of-war, a little sea-snail with a sail up, is common ; it can veer this sail according to the course it means to steer. The sea-marygold, a species of sting ray, is met with between the Gulf and the Banks ; it is of many colours, but yellow prevails,—whence it takes the name.

Passengers, generally, are anxious to see land : some of them boast of having good watches, equal to the best chronometers for regularity of movement. They keep reckonings by their account, which, according to their hopes, are far ahead of the ship ; and it not unfrequently happens that the vessel is found to be beating about on the Banks of Newfoundland, instead of being, according to them, snug at anchor in the harbour of Quebec.

BANKS AND ISLAND OF NEWFOUNDLAND.

THESE famous shoals seem to be formed, as all minor sand-banks are, by the depositions which take place wherever contending tides, eddies, and currents prevail. The great discharge from the fresh-water rivers of Canada by the Gulf of St. Lawrence and Hudson's Bay, uniting with the Gulf stream and western setting tides of the Atlantic, creates that singular commotion in the waters, distinctly felt at a considerable distance from the shores of North America, while their various sediments incline to the bottom. That these Banks continue to shift is almost obvious from the soundings taken upon them at various periods. In some instances, they have risen so high as to become flats of dry land: Sable Island and others are instances of this. These islands continue to enlarge, and the waters round their shores to shallow: they may therefore become,

in course of a few years, very fertile lands. And what seems singular, when these banks have emerged above the ocean any considerable time, they get covered with forest trees. Whether the seeds of such trees are naturally in the soil, or floated to it from the distant wilderness, is a question. Thus, it seems, we have reason to suppose that, in the course of time, the present Banks of Newfoundland will expand above the waves to the extent they do below, and be then as eagerly prized by the agriculturist, as they are now by the fishermen. The Continent of America will then have advanced on that of Europe by several hundred miles; whilst other banks, with their myriads of fish, may be encircling the islands of the Azores. And would we push the speculation farther, who can tell but that Great Britain and America be united, or Europe swallowed up by the great western Continent? The Banks at present are macadamised with crabs, cockles, and shell-fish of various kinds, to many of which we are yet strangers. On these, cod, turbot, halibut, and such fish feed; while other larger fish come hither and devour them: so the Banks absolutely seem to live and grow from the numerous aquatic animals that resort to them. The Island of Newfoundland appears to have been

produced after the same manner as those we have been considering; and it is a lamentable thing that only the coasts of it should have been explored, and those but imperfectly. The interior is doubtless full of various excellencies in natural history, some of which might be ultimately turned to our benefit; but no one has yet dared to penetrate its wilderness and minutely examine its contents. As a fisherman's island, it is certainly unequalled in the world; but the dreary fogs and long cold winters that beset it, render it gloomy and cheerless. Fishermen should try the effects of the lobster-trap on the Banks. The seal-trade, too, ought to be better attended to now, as gas-lighting has become so general in the luxurious world. The small rivers which fall into the Bay of Chaleur swarm with the finest salmon fish, which are also very much neglected in this and all the other bays opening into the Gulf of St. Lawrence.

The tides generally rise in Chaleur to three feet, in spring tides to six. Trap-nets might, therefore, be fixed to some advantage in the shallows. Snow and ice are both very plentiful in their season, and proper houses might be constructed to preserve them in the summer; a small steam-boat would then carry the fish while sweet to

Quebec, where a ready sale could at once be obtained; or to Montreal, where they would be always very graciously received. Such things require a little cash at the outset; but, as the thing is now represented, fishermen will soon be seen there.

THE ISLE OF BIC.

THIS is a large uninhabited island in the river St. Lawrence, about three miles from the south shore, and one hundred and fifty from Quebec. The following account is from my Journal, kept during the voyage.

“ Brought the ship to anchor in seven fathoms water, about two miles from the shore, between the island and the main land, thinking that by giving her a *rest*, she would be more *refreshed* to pursue her journey against a head wind. The jolly-boat was prepared to go ashore on the island to get spars, and some grass for the live stock. The Captain asked the passengers if any of them would accompany him; but as it was just at dinner-time, none of them would go but myself, who certainly needed no entreaty, nor would the best dinner in the world have kept me from the ex-

cursion. The Captain took with him the second mate, and the carpenter, with a Canadian, one of the crew of the name of Harry; *Ringy*, another of the crew, nicknamed so from his wearing earrings; and the boy, Carroty Pole, who pulled the bow-oar, and I pulled one ashore for *fun* myself. We took with us in the boat, a hatchet, an adze, a bag and cords, a compass, spy-glass, a jar of rum, another of water, with some biscuit. On nearing the island, the fires on the main land, which had been burning all the week, the weather being extremely dry, now assumed an awful appearance, and gave the waters of the great river a deep orange tinge, while the sun glimmering through the smoke, seemed sooty and bloated; between the isle and a lot of high cliffy rocks on the main land, where I had seen a couple of bald-headed eagles the day before, there was ingulfed a dark blue mass of smoke, having a different appearance from any thing I had ever seen. There is variety in the hues of smoke as well as in its smell; that from a forest of spruce-fir in flame is quite different from that emanating from the houses of London. We landed in a sweet little bay, and having all got out of the boat, we clambered up to the summit of a bunch of rocks, doffed our hats, and gave three cheers. This was my first landing

in America. Round the rocky beach we observed plenty of gooseberries growing on their bushes—the sleek *green grozart*; and, as this berry was found of this colour in its wild state, we may conclude it to be the origin of all the varieties. A gentleman in Scotland, whom I knew, relished this kind: he must have had a natural taste. We also found abundance of cranberries, and others we knew nothing about; but I pulled some of all kinds, and have them preserved in spirits. There was a species of red-coloured currant, with a rough rind, that had a very singular taste. We rooted out bushes and all, and *bundled* various lots to the boat; we also procured an immense quantity of curious grasses and flowers, few of which I had ever seen any thing like before, and regretted that my botanical knowledge was small. We found growing profusely a large kind of goose-grass, the corn of which, then ripening, was saturated with a thick glutinous matter of a clear colour. There was a flower, very common, of a pink hue, having its cups laden with a sweet juice; the pea called the Indian vetch; the hemlock, dock, and marygold, were to be met with frequently. Having procured our quantity of herbage, we proceeded into the *bush* in quest of spars, where we found fine larches, and spruce enough for our

wants, while a stick of rowan-tree was cut to frighten the witches out of the ship, it being fancied, from the many foul winds we had been blessed with, that there were such characters aboard. Having returned out of the woods to the beach, the Captain and I took a ramble round the shore, until the sailors had their raft of spars prepared. We coasted the west headland, and found many sea-eggs, the shells of a species of fish, some rough, others smooth: we also met with many nests in which sea-fowl had been hatched and dun-coloured shells remained. We started out of the rocky creeks various cormorants, and other birds of the willock tribe. We often stood amazed at the immense quantities of driftwood which had at various times been rolled in on the desert shore, and flung up high and dry by the tides and storms: some of it was in a very decayed state, with gooseberry-bushes growing on it. Amongst this timber, the Captain found the last of a lady's slipper, which he carefully preserved, as a token of respect to the fair sex. There was also seen amongst it bamboo cane of various thicknesses, which must have been brought from some distant country by the eddies of the southern Atlantic. Having coasted a couple of miles, we entered a singular valley that stretched up from the shore into the heart of the island as

far as we could see ; on either side beautiful spruce-fir trees were growing. This vale was about five hundred yards wide, having a small stream of fresh water rippling down its middle. We followed up the stream and came to a lagoon, where a number of birds of the heron tribe—called *quack*, by the Canadians—were fishing. They were either so tame, or so much afraid, that if the grass of the valley had not been long and *tangly*, we should have succeeded in obtaining some of them even without a gun : they are almost as large as geese, of a dark-brown colour, and dirty-white head. This place would be a good situation for a settler to take up his abode, there being plenty of food for live stock ; and from the peas and wild-rye found growing wild, good crops of any kind of grain might be raised : from these circumstances, we called it the Vale of Food. The smoke from the south-shore wilds getting thicker, we hurried back to the boat ; and on returning, I fell in with, for the first time, the *arctic boulder stones*, described elsewhere. The native rock of the isle was a compact clay slate, dipping in strata towards the south-west.

As the tide ebbed out, we found enormous quantities of shell-fish, particularly mussels, and we might have shovelled them into the boat ; there

were also clams and cockles, with the large periwinkle, well known in Scotland by the name of Roaring Bucky; and we obtained specimens of flint and coral quite new to me. The raft being fixed, we got into the boat, and had a hard pull to get free of a surf that was beating in on the island: we steered for the ship by compass, as the smoke had quite obscured her. After an hour's hard work with the oar, we came into the lee of her wake, and got aboard well-pleased with the trip. These Islands in the St. Lawrence are well worthy the attention of farmers, fishermen, and naturalists; they are very rarely visited by man, and contain many things to which he is a stranger.

NOTES ON THE ST. LAWRENCE,
BENEATH QUEBEC.

SHIPS coming up the St. Lawrence, generally meet with pilots off Cape Chat, which is about three hundred miles below Quebec; but these persons take no charge of them until they are past the Isle of Bic. They are French farmers, and but poorly informed. Their knowledge of the seaman's art is, indeed, very small, and few of them can speak English so as to be understood by those who know no other language. They are obliged to undergo a kind of apprenticeship to the pilotage business; and during that time must make at least one voyage across the Atlantic. They are generally very snug-looking, are warmly clad, smoke their pipes, and swallow their grog, extremely comfortably. They make, at an average, about 250*l.* per annum, conducting about twelve ships up and down. They live to a good

old age, and are considered *rich* by their countrymen. The daughter of a pilot is fancied to have more charms than any girl else on the coast—the reason is obvious.

The pilots inform the sailors, that there is a personage who lives in the Bush, called St. Antonio, who has a method of bagging up the wind ; and that, if grog goes freely round to the glory of this Saint, the winds will be set free, and the ships allowed to proceed on their voyage.

There are no soundings in the middle of the St. Lawrence, until we are about a hundred and fifty miles up it. The snow on the banks in winter is about five feet deep. Sometimes the soil on the breasts of the hills will *shove* down with all its trees to the plains below. The spots where these *shoves* have taken place, are plainly seen from the river, and have a singular appearance. Milton's simile of the downfall of the rebel angels might have been derived from this scene.

The Mother Carey's chickens forsake the ships in going up the river, and follow the outward-bound. This singular bird seems to dislike the very appearance of land.

Numbers of little trading-vessels toil about in the river, and these have always a full complement of crew ; but none of them, like the Manx boats,

have any masters: they are cooks, captains, and sailors, turn about, and live very merrily together.

There are three islands of rock, called the Brandy Pots, from their being round, high, and extremely like one another: ships are often cast away upon them. Also a very dangerous place in the river, called the Traverse, where the waters have a strong tendency to whirl the ships ashore, unless aided by favourable winds, or tiding it at the proper times.

There is a singular high conical mountain seen away in the country, about ten miles off, called by the French Mount Carmel: I have met with nothing like it of the kind in Canada: it seems to be about 1500 feet high.

Ships going up the stream have to anchor at the turn of the flood-tide, unless aided by a very strong fair wind.

Numbers of shipwrecks occur yearly in the Gulf and River St. Lawrence; this proceeds from many causes. The pilots are none of the most skilful; the navigation of itself is intricate and difficult; the shoals of Manicogan are horrible. Then there are many ships sent out for timber, which are old, crazed, and unfit for any other trade. These are often laden beyond what they can bear; too much deck wood is heaped on them,

so that the sailors cannot get to the ropes ; and there are many ships so poorly found, that the captains cannot afford to give fifteen pounds to a pilot to take them up, and so endeavour to perform the task themselves. In spring and fall, they are troubled with cold weather and floating ice. One winter a ship was wrecked, and lifted by contending ice into a *flaw* : there she sat, high and dry, as the sailors say, and moved out of and in the Gulf, by way of the Gut of Causo, with the tides and winds, during the inclement season ; at last it melted, and she sank.

The scenery about Cape Chat is composed of high curving hills, closely planted to the top by nature with all kinds of trees, particularly firs. Where the soil is scanty, the trees are small in stature ; yet they contrive to grow in the most barren situations possible, on the bare rocks, to the water's edge, and sometimes in the water, to a certain extent. The country seems intersected with deep gullies and glens ; and the shades the sun casts upon them, while passing over, are strange, and not to be seen in a country cleared of trees.

Kamaraska is the sea-bathing place of the Canadians ; there they obtain salt water. Afar in the woods the smell of freshness becomes disagree-

able to those who have been used to the sea, and they feel the sensation very strongly. I think this absence of salt, which prevails on the American continent, operates against health; as in summer the decomposition of animal and vegetable matters is much more rapid than in Britain, which may be partly ascribed to this freshness. How happily we quaff the sea-breeze after being immured for a time in the wilderness!

To be aboard a ship in the Gulf of St. Lawrence in an extremely stormy, dark night, when the weather is bitter cold, is perhaps as dismal a situation as human beings can be placed in. Sometimes a blaze of lightning between the squalls will illuminate for a moment the awful scene; then over the bulwarks comes the icy surge, cutting to the bone; while the ropes snap, and the yards, topmasts, &c. come thundering upon the deck. We crawl about on the obvious brink of eternity—no one speaks to his neighbour—the soul which has not fortitude must sink—there is no vain cheering—the poor human voice is hushed, and anxiety begins to give way to resignation. We do not long for the morning, for it may be little better than the evening, and probably worse. Religion is then the stronghold of the Christian, and the hope after death becomes stronger than

the wish to survive. After a time the feelings become torpid, and misery loses its influence; nor do we recover with the first warm sun and fair wind; there is an impression left which years will scarcely obliterate. The anguish of dismay is not suddenly forgotten, neither can the smiles of Fortune ever fairly uplift the heart that has actually known distress.

CANADIAN CITIES.

QUEBEC, the capital of Canada, is built on a very high promontory that juts out from the north side of the river St. Lawrence; it may be said to be about 350 miles up this noble stream. There is an Upper and Lower Town, with extensive suburbs. The Upper Town is surrounded by a strong stone wall and fortifications; the Lower is nearly on a level with the river. The great fortification is on the highest situation,—of course, commanding the whole town. As the saying goes, the houses are chiefly built of stone, but there seem to be no good quarries near the place. Good material of this kind has to be brought from Montreal. The streets are well paved; and the public buildings look not so much amiss, but these have all been often described. The Chateau, or house where the Governor resides, is placed in a very fine and lofty situation.

The Parliament-house is much farther down the hill, at that place where flights of steps or stairs lead from the one town to the other. The top of the hill, or Cape Diamond, is about 350 feet above the river. An inclined plane is constructed between, that stone may be dragged to the extensive works termed the New Fortifications, which have been building there for several years past : the old were built by the French when the city was in their possession. Behind this Cape the land falls away gently, forming the Plains of Abram. The greystone, where General Wolfe fell, is yet pointed out. A monumental obelisk has been raised to his memory, which looks very well from the river. Wolfe's Cove is about three miles farther up the stream than Quebec ; it was here the brave officer landed his troops during the night, and crawled up a steep ravine to the heights, dragging the cannon after. The foe marched out of their fort in the morning somewhat astonished, and so began the desperate conflict. It seems to me, that if they had not come out of their fort, an act much reprobated by military men, the fort would have been very easily taken ; and that the best thing they could do was to come out and be honourably beaten, rather than remain within and allow them-

selves meanly to be smothered ; and I am farther inclined to think that, if a hostile Yankee army should appear on the plains, we should hurry out too, and meet it with the bayonet.

There is a reading-room here, as at Montreal, well filled with periodicals. The population is also considered to be as great, if not greater than there,—perhaps about 38,000 ; the French Canadians form the body of the people. The heat and cold here run to the utmost extreme ; mercury often freezes, and the sentinels, at their posts on the Cape, often perish by the cold. A brilliant kind of spar is found on the hill ; hence the name Cape Diamond : breast-pins and broaches are made of them. The improvements of this city must extend by way of the river Charles ; there is no room in any other direction. The tide rises here about eighteen feet at a medium. Ships have no harbour, as it were ; they anchor in the open channel of the river, where the water is deep, and holding-ground good. There are drowned here every year a great number of persons, the shore eddies being very strong, whirling amongst the wharfs with dangerous fury, where the waters of the river and precipice of the Cape seem to meet. The place is called by the French Cul de

Sac, or Bottom of the Bag, as here the contending currents deposit their stores:—hither run the friends of the drowned to look for their bodies.

Quebec is one of those rare places that I love ; the beautiful scenery, from the Cape, of the wild and strange country, the Falls of Montmorency, an Indian village in the distance called Laurette, the woody mountains, Point Levi, the British ships in the river, the rafts coming down from the remote wilderness, and various nameless things, refresh me much. There is less vanity and conceit here, too, than is to be met with in the country : here the Canadians will have their own way, and that way seems extremely interesting : here too we find some intercourse with the world, which is almost denied us elsewhere, and we can hold regular converse with friends at home, which is ever reviving.

Montreal is nearly as large as Quebec, and is supposed to have about 35,000 inhabitants. It is built on a swelling ridge of land, on an island of the same name, at the head of the natural navigation of the St. Lawrence, about 180 miles above Quebec. The streets are well paved ; the houses about three stories high, chiefly built of stone : in the suburbs there are many very inferior wooden buildings, deserving the character of huts

more than houses. There are in Montreal several French churches, well filled on Sundays by the Canadians; and there is one now finishing, a very large Canadian cathedral: which, had it been placed in a good situation, would have been a noble piece of architecture. The architect is a Mr. O'Connel, very skilful and attentive to his business. It is built on a slanting confined piece of ground; the French apparently have no idea of elegance in this respect. It is constructed of red limestone, well cut and polished; the order, I believe, is Gothic; the windows are to have stained glass; and the walls are to be plastered with fresco paintings. There are also English and Scottish places of divine worship; while the Methodists and Americans have also the same. The Theatre is tolerably neat, and the Masonic Hall hotel is the most splendid building of the kind on the new continent. There are four or five newspapers published weekly—the Herald twice a week; sometimes they contain articles of no mean talent. The majority of the inhabitants are French; but the Scotch and Irish, taken by themselves, are more numerous than the English. Some of the unthinking Scotch ape the manners of the latter, and are termed *Canadianized Scotchmen*. A good deal of the Yankee mannerism runs

through the whole ; nevertheless it is a tolerably comfortable place. In winter the markets are thronged with people and provisions. Strangers are apt to dislike this city, from the wonderful importance that many of the leading merchants imagine to belong to their character. The following letter to a friend in London, gives an idea of the manners of the people.

“ You are quite a townsman, my dear fellow ; so it is needless for me to *bore* you about lakes, snows, serpents, &c. I have been through all the Canadian cities, towns, and villages, worth speaking about — Quebec, Montreal, Kingston, York, &c. The inhabitants are tolerably civil. In a common tavern, your food and bed will ease your pocket of a dollar a-day ; if in an hotel, half as much more, exclusive of wines, which are so so —no great shakes, a dollar a bottle—and grogs in proportion. The fashionable young fellows follow a good deal the manners of the Americans—drink gin sling, sangaree, and lemonade, smoke segars, and in the morning take bitters, cocktail, and soda-water. The theatres are not open very often, unless some of your stars get erratic, and come over the water. I have seen Kean at his old Richard here : he is ruffed much, and I dare say deserves it ;—as for me, I never ruff any body, but

keep quiet. They have their parties and their scandal through all the towns, the same as at home. You are well off who are not bothered with these things in London ; it is the only place in Britain where pride and presumption dare never show themselves, and where scandal can never thrive. The ladies dress very well, and seem to have a considerable quantity of conceit ; their dresses here are not so plain and so elegant as with you ; they have too great a profusion of flounces, feathers, and ruffles : few of them are to be met with very good-looking ; the climate robs their complexions of all the beautiful colours, leaving behind the sallow, dun, and yellow : no pure red and white in Canada, and dimples and smiles are rare. I endeavoured to fall in love once or twice, and flung my old heart quite open to the little archer ; but the frost, or something or other, would not allow the arrows to penetrate. I have met with girls from my own Old Scotland, that I liked to spend the day with very much, but they had no pretensions to beauty ; we could talk of witches, and quote Burns together. But this love proceeds from many causes, which have but small connexion with beauty of person ; it is to be traced to the affinity of mind—Humph !

“ Your gentry, with their swords, buttons,

&c. figure about here, and the people like to look at them: it is all very fine; they flash round the streets, and are to be met with at every turning. It would be a good thing, we often think, if friend Jonathan would give them something to do: they are much more thought of here than at home; here nobody may become somebody; an insipid trifler, a delightful gentleman: what you would not look at in England, is stared at here with admiration; and what you love or admire at home, is not to be found. If you would show off and become of some consequence, you had better come over as soon as you can find it convenient; but if you love respect and no nonsense, as you do, stay at home. Those who have wives here seem to kill them with kindness. You would fancy that the ladies in Britain receive more attention from the lords of creation than in any other country; but let me tell you and them, that there is an error in the ballad. What must not be said before ladies here on any account whatever, may be said before them with you without any notice at all; and I am sure you are as great judges of delicacy as they are. They have frequently hushed me to silence when going on swimmingly with some of my favourite anecdotes and tales, that I had told a hundred times

before much more respectable people, to my judgment, than they are or ever will be. I have seen a counter-jumper, *alias* a shopman, assume the office of reforming the manners of the age; nay, I am certain, that even if the celebrated Beau Brummel had been with me,—he who caught cold from a damp man entering a room in which he was,—he would have met with many who would have beggared him at the affectation of delicacy.

“Do not let yourself be any longer deceived with the tale that there are no unmarried ladies here, for there are in the greatest abundance; and also more bachelors than I like to live among, having boarded in a house for a few days where there were above thirty bachelors, between twenty and forty years of age, every day at dinner. What do you think of this? Canada is not a place for people to get married in. What is the cause, it is not easy to assign; methinks it proceeds from the bachelors being chiefly foreigners—people badgered up and down this world, who forget that there is such a state as matrimony. Those who are long without a home get careless about finding one. The natives, however, and settled residents, wed as becomes them; and at their weddings they have what are called Shireveerees, a parading kind of a show, with sleighs if in

winter, or a two-wheeled kind of gig, if in summer. Round the towns they fly—what a set out!—fiddles playing, pistols firing,—altogether composing lots of fun: a true Canadian *spree* is worth the looking at. In Montreal, the snow accumulates to a great depth in the streets during winter, rendering the walking very precarious: people wear a kind of crampon on their feet, called creepers, and the ladies move about with stockings drawn over their boots. The Scotch brogue here is not only conceived vulgar, but highly offensive. How they turn up their noses when they hear me speak! To please them, I have set to work to study the English lisp, and I dare say time will make a beau of my grannie. How polite I find myself getting! soon I shall not know where to look for Scotland on a map of the world; and as to Sir Walter's writings, his Scotch characters do indeed—(*O yes!*)—disgust me.

“I take great delight in walking through the market-places and examining every thing that comes to be disposed of, and I really meet sometimes with singular articles: amongst other things is Indian grass, that smells like the tonquin bean; the butter seems good, but there is no cheese; vegetables they have in great abundance, and fruit,—beautiful apples called pomgrees. The

Indians produce their handy-work in the shape of baskets and mocasons. There is a pleasure in getting into the midst of a club of country Canadians; how they do gabble and laugh, and how fond they are of dollars and half-crowns! They lodge none of their cash in the banks, but keep it in the corner of a chest at home; and I have been told, that there are marketing madams who have no inconsiderable hoards by them. During winter, there are at times assembly balls, got up by some lady patroness or other; but I never made any attempt to go to any of them: perhaps, if I had, my absence would have been cordial. Had you been here in your buffs and bang-ups, there is no saying how you would have figured off. Strange world this we live in!—True, O king! You on one side of it, and I on the other; nevertheless we are ever on the same as regards esteem and affection.”

RUMMAGING.

THIS is the art of exploring whatever lies in a state of nature, or in one that may be considered similar; it may also be explained as a method whereby curiosities are discovered, and singular information obtained. It forms no uninteresting study, and some, I have heard, prefer it to phrenology; examples, however, will throw more light on the subject. Having been told of mountains of iron ore, by my famous and worthy friend Philemon Wright, Esq. of Hull, we took our way on horseback through the forest to inspect the said ore-bed, that had begun to make some noise, and had hindered the magnetic needle of many a surveyor's compass from traversing properly. Four of us mounted, with a guide, at the celebrated Columbian hotel, and away we went; our conductor having provisions, axes, hammers, &c. in a bag on the saddle with him. Having cantered

away a couple of miles through cleared land, we began to enter the wilderness; and as I am no great horseman, let the animal or the road be ever so good, I soon found my eyes and nose beginning to be scratched to death from the brushwood lashing and rubbing against them,—and soon, alas! I found myself comfortably landed on my back on the trunk of an old tree that had fallen by age many years before. On looking round me, I saw my quiet old pony, thinking for a wonder what was become of me, one of his fore feet having trod out the crown of a good new thirty-shilling hat I had bought in London. My companions gathered round, but could not prevail on me to mount again; the guide led the horse, and I trudged along on foot. Getting weary, however, and seeing the comparatively easy manner in which my friends the Americans got along, in spite of the thick brush-wood and old trees that lay stretching over one another at all angles, I got upon the back of the quiet little animal again, but soon found it almost impossible to follow my companions, without getting myself bruised in all quarters, and perhaps some of my bones broken. They had got about an hundred yards before, and halloed out to me to follow; I exerted myself to the utmost, but one of my legs getting into the cleft of a

small tree, I was torn off my horse's back, and left amongst the briers again. Bawling out, they waited until I came up: none of them but Mr. Mackay, as good a Scotsman as lives, laughed, and I was almost inclined to curse him; the fellow being a good horseman, and used to the rough roads of Canada, could keep his seat on the saddle in a way, but the skin of his legs was partly peeled like my own, and his clothes torn in various places. After travelling a great deal, riding but little, and being pulled down frequently as described, we got to a stream which the guide said had its origin in the iron-mountain. Proceeding up the stream to its source, we at last came upon the famous ore-bed; but through excessive fatigue, after having taken a little refreshment, I fell asleep, as did all my companions but one, the enterprising Lord of the Manor of Hull: he kindly let us take a nap for about an hour, when he roused us, much recovered. Traversing these wild mountains in all directions, we were much pleased with immense specimens of iron ore that everywhere appeared; and said to ourselves, that this place might be a muirkirk at no very distant date. Mr. Mackay wielded the hammer with masonic skill, and laid the rich rocks open to inspection. These mountains seem to range over an extent of more

than four miles square : at one place they are not more than two miles from the first Falls of the Gattineau, where a road might easily be constructed, and where machinery and engines could be erected at a very moderate rate, as water-power may be had to any extent from the Falls. The country all round is growing thickly with hard wood, particularly maple, which makes the best charcoal of any. From all I can think, this is the best place for an iron-manufactory in Canada. While examining these mountains, we filled the bag with various specimens of minerals, such as iron felspar, hornblende, native iron ore, granite of various colours, white, grey, and red, and a kind of stone very common in Canada, which we called Limestone granite ; it being limestone that calcinates to powder, yet to all appearance by fracture granite. We also found marble blocks of great variety, white, green, and variegated.

The stream before-mentioned discharges itself into the Gattineau near to the Falls, and has washed down, through a series of ages, great quantities of the finest particles of plumbago ; the banks of the river in that neighbourhood being covered with it to a great extent. I tried its effect in furnishing metals, and found it surprising, making my rusty bush-knife gleam with brightness. We at

length thought of returning to the inn. Night came on, and in the forenoon of the next day I found myself alive at the Falls of Chaudiere: the troubles I had undergone were amply repaid, my bruises recovered, the skin came over my arms and legs, but I will never try to explore the wilds of Canada on horseback again.

When I first arrived at the Rideau, the Governor of Canada, Lord Dalhousie, and Colonel By, were there, and had fixed the entrance of the Rideau canal to be in Rafting Bay; a beautiful bay about two miles farther up the Ottawa river than where Mr. Samuel Clowes, Civil Engineer to the Provincial Government of Upper Canada, had proposed, as being the only practical place where the Rideau river could be carried into the Ottawa by a canal. Accordingly, my first duty seemed to be that of proving if the said engineer was right or not; Rafting Bay being by far the most elegant entrance for the canal, and nearer the head of the Ottawa navigation.

Having procured three faithful men to assist me to explore, as many axe-men, and two to carry provisions, we sallied out into the woods in the beginning of November 1826. The axe-men continually cutting down a line through the underwood, we were enabled to take, what is called in surveying, a

flying level, which is a rough guess to a foot, more or less, of the rise or fall of the country above any fixed data. Having continued at this fagging employment for three days, my assistants keeping in the neighbourhood, returning nightly and giving information respecting swamps, gullies, streams, mountains, &c. I at last came upon the famous Rideau, at a distance of between four and five miles from the above beautiful bay.

Taking a level of this extent in England would not have occupied more than a day; but in a dark dense wood the subject is quite altered, and a surveyor has to change his home system altogether: for instance, if we get upon a hill or other eminence in Britain, we may see the natural lead of the land; but in Canada, owing to the wilderness, you have to grope for this like blind men. On coming out on the river, I found it to be forty-five feet above the level of the Ottawa, and that if a cut were to be made from thence to the valley which descended into the bay, a rocky ridge would have to be broken through, nearly two miles long, and about sixty feet deep to the bottom level of the canal. To attempt such a work would have been madness: the thing is by no means impracticable, but it would devour an enormous sum of money. Finding this, we left behind our various scientific instruments,

and ascended the river. Having penetrated about three miles, we came upon foaming rapids, where the river was narrow in width and the banks high. Here was the famous Hog's Back, and here we proposed to raise the river by a dam, so that the water might be brought on a level with the head of Entrance Valley above alluded to, which was eighty feet above the Ottawa. But the question arose again, if the river could be raised here to the required level, was it possible for us to retain that level through the wilderness,—a distance, as we supposed, of seven miles? To ascertain this, now became the object of research, and we set to work accordingly; but meeting with various gullies, and huge swamps, to get through which (they being full of water) became almost impossible, we waded, and were often obliged to crawl on our hands and knees under the brushwood, and this in water. Finding, therefore, we could make no good job of surveying them, until the swamps froze, we wended our weary way to the Ottawa as we best could, and there awaited the coming of the frost, which did not happen sufficiently for our purpose until the 20th of December, and then it was accompanied by a foot-depth of snow. No matter; we started again, cut holes through the thickets of these dismal swamps, directed a person to go about half a mile before,

and wind a horn, keeping to one place, until those behind came up; so that by the compass and the sound, there being no sun, we might better grope out our course. For in the woods you have not only to keep to a course, but you have also to discover what that course is; not as on sea, where the course is known, before the ship starts, that one port bears from another; but in the wilderness the relative position of places is not known,—a cause which improves the instinct of the Indian, making it so superior to that of a European. We had this matter to study deeply; and we had likewise to seek for that track where we could best preserve our level, in the shortest possible distance. This compelled us frequently to diverge from the direct course; a ridge of rocks or a deep swamp, the one much above, the other beneath, the required level, had necessarily to be shunned as much as possible.

I mention these things out of no vain boast, but as curiosities in science, and must own that the subject perplexed me not a little. Placed in thick and dark snow-covered woods, where, unless the axe-men cut holes, a prospect of five yards could not be obtained; doubtful what kind of land lay on either side, or directly before; calculating at the same time, the nature of canal-making in such

places, the depths to dig, or the banks to raise, so that the level might be kept from one sheet of water to another, the former eighty feet above the latter ; while the weather was extremely cold, and the screws of the theodolite would scarcely move : these things all considered, were teasing enough to overcome, and required a little patience. When night drew on, two of the axe-men were sent off to rig the wigwam *shanty* by the side of a swamp. This was done for two reasons, or say three : first, because water could be had in the swamps to drink and cook with, if the ice were broken to get at it ; secondly, the boughs of the hemlock grow more bushy in such places, and are so far more easily obtained to cover the shanty ; and thirdly, there are generally dry cedar-trees found there, which make excellent firewood, and the bark of dry cedar is the best thing in the world for lighting a fire with. When the party got to the place, there was a very comfortable house set out, a blazing fire with a maple back log, ranging along for a length of twenty or thirty feet. There, on the bushy hemlock would we lie down ; roast-pork before the fire on wooden prongs, each man roasting for himself ; while plenty of tea was thrown into a large kettle of boiling water, the tin mug was turned out, the only tea-cup, which being filled, went round until

all had drunk ; then it was filled again, and so on ; while each with his bush-knife cut toasted pork on a shive of bread, ever using the thumb-piece to protect the thumb from being burned : a *tot* or two round of weak grog finished the feast, when some would fall asleep,—others to sleep and snore ; and after having lain an hour or so on one side, some one would cry *Spoon!*—the order to turn to the other—which was often an agreeable order, if a spike of tree-root or such substance stuck up beneath the ribs. Reclining thus, like a parcel of spoons, our feet to the fire, we have found the hair of our heads often frozen to the place where we lay. For many days together did we lie in these wild places, before we could satisfy ourselves with a solution of the problem already represented. In Dow's great swamp, one of the most dismal places in the wilderness, did five Irishmen, two Englishmen, two Americans, one French Canadian, and one Scotchman, hold their merry Christmas of 1826,—or rather forgot to hold it at all.

These instances of Rummaging occurring the first year I left London, made more impression on me than others I could detail, fraught far beyond comparison with hardship and difficulty. For two or three months at a time would we penetrate up these wild rivers, wading past the

rapids for miles together, or clamber through a dreary country, bitten with insects night and day—with bloody, swelled faces; while the heat of the sun blistered the skin exposed to its rays, producing frightful ulcers; while the water was perfect poison to drink, and our food far from being plenty. Often a rock or root would run through the bottom of our canoes; and sometimes they would upset in the rapids, whereby the provisions would be much injured, and ourselves half drowned into the bargain: nevertheless, we met with strange scenes, which kept the spirits from sinking. If the mind can find nothing interesting, disease and every evil afflict both it and the body; but where it can find plenty of employment, dangers and difficulties are easily surmounted. In winter, we traversed distant regions on sleighs, and in snow-shoes; broke through the ice frequently, and got ourselves wet and frost-bitten:—no matter; there is ever some balm in Gilead; and although nothing on earth would make me do over again what I have done, still I might undertake an enterprise that would ultimately turn out worse.

In some of my curious wanderings I was accompanied by Colonel By, of the Royal Engineers, a gentleman I shall ever esteem and value. He

encountered all privations with wonderful patience and good-humour ; was even too daring in some instances ; would run rapids that his Indians trembled to look at ; and cross wide lakes with the canoe when the Canadians were gaping with fear at the waves that were rolling around them. He could sleep soundly any where, and eat any thing, even to raw pork. One night we lost ourselves altogether in Craneberry Lake, on our route through the waters from the Ottawa to Lake Ontario. There were two canoes of us, and the poor fellows paddled away lustily ; but it was of no use ; the more we sailed, the farther astray we went, and could not find the outlet of the river Cataraque. Getting through a frightful marsh, partly overflowed by water, we entered with the canoes into an expanse of flooded woods, and one of the canoes stuck in the fork of a tree buried in the water. We went alongside, and the crew having got into the other canoe, we succeeded in lifting it out of the fork. Dark night came on, and we landed on some sort of wild shore about ten o'clock, clambered up the brow amongst the trees, and pulled the canoes and their cargoes after. We had parted with our provision canoe on the morning before, and appointed to have met with it that night at a station called Brewer's Mills : thus we

had nothing to eat but a small bit of cheese ; and as for drink, there was nothing but a little drop of brandy in a bottle, and this was not allowed to be touched. There we were, no one knew where, in the heart of an endless wild, without food or any thing else whatever for the comfort of human life ; but we minded it not. Although we had had a fagging day, no one was inclined to sleep : could we have knocked up any thing in the shape of a dinner, we might then all have snoozed profoundly ; but hunger kept us from the arms of Morpheus, and allowed us to ruminate on our forlorn situation. We hallooed out frequently as loud as we could, but no one heard us. We were sometimes answered by the owl, afar in the solitary woods, and the lake bird, called loon, also deigned to reply from the distant waters. At one time we heard, or thought we heard, the barking of a dog,—which might have been so, but I thought it that of the wolf species.

Having a gun with us, we succeeded in lighting a good fire, which is always a pleasant thing to look at ; while the light reflected aloft on the woods was beautiful. We frequently loaded the gun with powder and fired it off ; and the sound reverberating through the forest and rocks

was heard for a long time after. Thinking we had got into Loughborough Lake, which opens out of Craneberry Marsh, to vards morning we started with the light of the moon, and after paddling away five or six miles until we came to the head of a deep bay, swimming-full of drift-wood, we there put about, and were glad to get back to the fire we had left on the unknown shore. We had supplied it well with fuel before we started, in hopes that we might use its light, like that of a Pharos, to guide us on our proper course; but, alas! we now all began to droop a little, for there was a probability that we might not find our way out of the Lake, and of course, therefore, must perish.

The sun arose; we took to the canoes again, and seeing some wild ducks, we shot at them several times, but could not succeed in killing one of them. Having paddled away several miles, and taking our bearing by the sun, the compass being useless, I found we were returning as we had come the day before; we therefore lay to, to strike the course. While doing so, we heard the report of a musket at a distance. We bore away to the place whence the sound proceeded, heard another shot let off, and even saw the smoke. It was

an Indian shooting wild ducks. We all felt rejoiced to see him, divided the drop of brandy, engaged him as a guide, and he brought us out at the famous Round Tail mouth of the Cataraque; from whence we proceeded to Brewer's Mills, found the provision canoe, and made a hearty breakfast. So much for that time when I was bewildered in the Craneberry Marsh; but it was by no means the first time. I had spent many dismal nights in it before, and only narrate this on the score that Colonel By was with me, and conducted himself as became a man.

A lake, therefore, cannot be explored to advantage, without frequently running astray; the oftener wrong, the more knowledge is acquired. Where any matter is known, curiosity ends; but while doubt and mystery cloud the lovely face of Nature, there is employment for the *rum-mager*.

Being at the funeral of a respectable native of La Prairie, I met with a young man who had just returned from a distant excursion in the fur-trade. He gave me an account of his route, the circumstances of which so well pleased me, that I embodied the information for my friend in the following letter.

"DEAR SAUNDERS,

"IT is with the most consummate happiness, my old cock, that I have to inform you, that the grand object of my summer's wandering hath been accomplished. I have penetrated the wilderness of the Missouri, and found some remains of an ancient city, as hath been stated; but there seem to be no brick buildings, nor Doric columns, though some dovetailing, tolerably executed, may exist. On the banks of the Wabash, I looked into the caves of the mammoth, and have brought, O Saunders, for thy edification, a most perfect knee-joint of the monster:—a particular, and, I would fain hope, highly interesting account of the *Mammoth Caves* is forthcoming, together with some singular tales respecting the habits of the animals of the antediluvian world. In sailing down the Ohio, we came upon a den of rattlesnakes: this, to me, was in the highest degree delicious. The den was in a clump of brushwood, exposed to the sun; the cadence of the rattles much amused us, as no snake is so ill-bred as to strike his rattle whilst another is sounding. O that Jonathan would take a hint from this, and neither guess nor gabble while another person in company governs the conversation!

"After considerable travel and fatigue, we came

upon the Rocky Mountains, alias the Backbone of America; and here, as you may expect, all my mineralogical science was brought into full request. My bag is full of the rarest specimens, and, what will astonish the sons of Mammon, I have both gold and silver ores. In fact, I conceive these mountains to be much more valuable than those of the Andes. The crow-bar will be at work there directly, Saunders, and ingots turned out as quickly as slate-stones. A new Mining Company will be formed in Lombard-street, London, before you can say Jack Robinson!

“ On Lake Winnipeck, I met Captain Franklin, from Bear Lake, bearing home with all sails set: he is a hardy rook, and, I dare say, would outdo me at regular rummaging. We finished a brandy-flask between us, and then away went he and away went I, whilst the voyagers struck up *Chantez doux*.

“ When at the forks of Red River, I beheld with sorrow the battle-field of the Fur Companies—you know where I am. High waves the grass over the place where Governor Semple fell;—the ghost of the murdered are frequently seen stalking about, and even heard howling at times in the woods, sometimes like a loon, at others like an owl.

“ At Moose Factory, I fell in with the sociable

and good Governor of the Hudson's Bay Company, Mr. Simson : he laid before me the whole of the fur-trade ; and really, Saunders, I must draw you out a copy of my notes on that interesting subject ; they are much more curious than you can possibly imagine.

" Returning from Hudson's Bay by a new route, I met, about the head of the Peace River, with a party of fur-traders from New York. Their canoes were full of pieces : the fellows knew well where to lay their hand on peltry. Where any game is to be had, Mr. Yankee must come in for a share.

" I have often gone a-hunting with the Indians, and not unfrequently rifled a bear, a fox, or a buffalo of his life. Speaking of rifles, they are a species of fusee not sufficiently studied in Britain : they were the weapons that galled us in the late American war. The foe gets behind the root of an old tree, and quietly selects the officers of an army as his victims, and pops them like sparrows at a quarter of a mile's distance.

" Deluding deer at night with a lantern and candle, and then lodging a slug in their vitals, seems to be a favourite murdering kind of sport with the traversing tribes of the wild rivers of Canada. How frequently have I seen the eyes of the poor

creatures flash at the light of the candle, that the pan of the musket might flash in return. It is a false idea that people have in the old country, that we may enjoy good shooting in Canada; no such thing. Wild ducks we may *blatter at* out of a canoe, and have some laughs at the scene; but all else is pot-work and slave-work; no fun at all. Emigrants always bring out guns, and the best of guns; but they are like a countryman of ours, Saunders, who brought out a curling-stone, and never got a shot with it. For all the ice in Canada, confound it if he could find a *rink*: and for all the game—you may fag yourself to death in the bush in quest thereof, and bring home nothing at night, saving, perhaps, a long-necked heron.

“The extensive savannahs of Asnaboyne, where the wild horses and buffaloes range, are beautiful to behold, and the wild regions of Athabasco amuse the poetic fancy. While coming into the civilized world again, I had nearly lost my life at the Appletree Falls, Grand River: away went the canoe, as we say in Scotland, “heels over gowdie;” but, being a tolerable swimmer, I reached the shore. So after arriving at the village of the Lake of the Two Mountains, and seeing my Indian friends, &c. I got to Montreal, and found you absent. The next trip I take is to New York, to

see the States' people at home; and I hope when I do see them, I shall have a more favourable opinion of their worthy deeds and glorious achievements than I have hitherto.

"You are bustling yourself about politics, I see, as usual: these are things I know nothing at all about. Try to keep people in peace, however; you will never receive any thanks if you bother yourself about setting friends together by the ears.

"By the by, my spouse Kate, honest body, begs to be remembered to you. She has been inquiring much about your dear Bell of late: this is natural, I believe, in women, when they feel themselves in a certain situation. You mean to bring grannie to this country. Now I think you must consider that business more philosophically; the danger of bringing an old *Mause* out of her native glen is very great, and may operate against even her tough constitution.

"Be pleased to keep this letter out of the hands of those editor folks. Look upon it more as a private epistle than a thing written for the critics of Canada. You know my extreme delicacy on this subject. I have all my life detested to appear in print, and yet you see how often we have been both dragged into it. When I do sport in the press, let me be aware of it; then I

shall cut my pen, and trim my genius accordingly : then you shall see me make wonderful dashes, soaring, like a poetic cronie I once had, this moment 'amang the stars,' and the next down below, 'amang the puddock-stools.'

"Letters from Scotland have winged their way to me during my absence, and even from one My-narble, Isle of Man. This Manks letter is a curiosity in its way. The fair of Laxy is a piece of notable colouring : I shall show it. That fellow from Ruglin, that old fool Robbin, you know, means to come out to this country. You may remember that crambo sonnet of mine in the Montreal Herald,—that has awakened him. In truth, some of your letters and some of my own have created a wonderful sensation about Clyde side. I dare say, if I petitioned his Majesty at present, he would give me an additional situation of 'Deputy Assistant Emigrant General.' But I need not complain ; my birth of 'Rummager General,' which I have now enjoyed for some years, with its accompanying salary of sixty pounds, is enough for me, and the '*Curiosities of Canada*,' first volume (there will be ten), now publishing in London, will bring me at least a hundred more—so says my bookseller.

"But where am I running? writing you a long

foolish narrative: there's no use in it;—this night, Heaven willing, I'm at your fire-side, when my budget shall be opened effectually. Meanwhile, believe me, my dear Saunders," &c

Note.—The modesty of the Indians is very great. Their noble chief, De Campsie, being at a party once, where English ladies were showing off their snowy necks and lovely heaving bosoms, on being asked what he thought of them, replied, shaking his head, "They show much too great face for me."

The Indian children are nursed in a case of wood, and the poor little dears seem very happy in this shell, as it were: when the mothers give them the breast, one would think, they were holding up a violin to play. Perhaps it is from keeping their infants in this position, that they are so erect in stature ever afterwards, although they generally walk in-toed.

FROSTS AND FLOODS.

DURING the winters, I used to indulge in reflections respecting the ice and snow, and make a few experiments on them. It was found that about six cubit feet of lake ice made five feet of water when melted; and of river ice, which was not so compact, particularly if near to a fall or rapid, eight cubit feet required to be dissolved for five of water: the most compact black ice anywhere to be found, will be about five and three-quarters to five. Canadian ice is not so compact as that to be found in Britain: the thinner the ice, the more solid it is; when thick, it is more full of little air cells, and of a greyish colour. It is not of so hard a nature, either, as that at home; a person can cut a hole through it with a hatchet as quickly as they can at home, although it may be four times as thick.

In the winter of 1826, the ice of Lake Ontario, when at the thickest, was within half an inch of two feet; the Lake of Chaudiere was three feet and a half: they are not so thick, by about half a foot, towards the middle, and begin to take (that is, freeze) round the sides first before the middle; sometimes towards the centre they will not freeze at all, unless the frost be very severe. The road for sleighs is, therefore, round the sides. The Canadian adopts this for two substantial reasons: first, that the ice is more safe there, and, secondly, that should it break in, he has a better chance to get out. Often horses and sleighs will break smack through, sink beneath the ice, and be seen no more: the drivers generally contrive to escape, although sometimes they get entangled or confused, and sink with the rest. An honest settler and his wife were cantering along the Ottawa to hold their merry new year in Montreal: what a gay set-out! and what a span of beautiful American bay horses! they went like the wind; while the cutter (an elegant species of sleigh) tilted over the cracks and cahots in glorious style. My much respected friend John Sherriff, Esq. was a passenger aboard,—who would not have had his interesting company if it were to be obtained?—a profound connoisseur in the news and manners

of Canada, deeply read in the periodical literature of the old country, a great traveller all over the world, ever retaining a good and cheerful disposition. Often would he warn the farmer to take care of the ice, as about the eddies of Long Island it was never to be fully depended upon; but the other still replied there could be no fear, seeing by the track that two laden traineaux had lately passed before them. Thus gliding along with a swift and smooth velocity, down they went with a plunging crash. My humorous friend, whose presence of mind never forsook him, vaulted on to the solid ice, and very politely handed out the lady; while her husband, poor fellow, kept touching up the cattle slightly with the whip, uncor- as of his dangerous situation, and, had my friend not caught him by the coat-tail, he would have sunk, like his horses, beneath the cold casement of the river, to be seen no more. If the horses are allowed to plunge much, there is no chance of saving them: they have therefore to hang them, to keep them quiet, until they are pulled out, when the noose on the neck is slackened, and life permitted to return. While on this subject, I may mention a question which was once laid before me for decision. A gentleman sent his servant with a sleigh and two valuable horses to a neighbouring village

for some purpose or other, when this servant and another servant of the same gentleman, who was likewise there on some business of his master's, happened to meet: the one who had charge of the sleigh getting intoxicated with rum, the other insisted on driving the vehicle home for him: while doing so, the ice towards the middle of a river gave way, and the horses, sleigh, and cargo, were lost. "Was it proper, or not, to dismiss those servants from their master's employ?" The voice of the multitude was in favour of the servants, but I doubt if that was right; humanity, however, ought to be coupled with rigid justice. In England such servants would have been turned off; but there they can soon find other masters, and masters other servants:—not so in Canada.

The large lakes have never such a thick flooring of ice as the lesser under the same parallel of latitude. Thus a lake twelve miles long by six broad, will not only have thicker ice than one a hundred miles long by fifty, but also surpass a lake three miles long by one broad: in the first case the waters are prevented from freezing fast by winds, eddies, &c. and in the other by trees.

A quantity of virgin snow will be dissolved by thawing to about one-fortieth part its bulk of water; if having undergone the greatest compres-

sion, one-tenth will be about the mark: the weight, dissolved, or not, is the same, if no evaporation during the process of thawing take place. I had to regret my want of good apparatus in these wild and distant places, but found, with the rough tools I had to work with, that the fresh water in winter was heavier than it is in summer; even the water of melted snow was lighter than the common water of winter. When swimming in the lakes or rivers in summer, that degree of buoyancy which we feel in the ocean is much reduced; we are often troubled to keep the mouth free: hence one of the causes for so many people being drowned in the hot season.

The great river St. Lawrence discharges to the ocean annually about 4,277,880 millions of tons of fresh water, of which 2,112,120 millions of tons may be reckoned melted snow; the quantity discharging before the thaw comes on being 4,512 millions of tons at an average per day, for 240 days, and the quantity after the thaw begins being 25,560 millions per day for 125 days, the depths and velocity when in and out of flood duly considered. Hence we find that if a ton of water be nearly equal to fifty-five cubic yards of pure snow, this river frees a country of more than 2000 miles square covered with it three feet deep.

There are rivers in Canada, such as the Ottawa, and Gattineau, that have two floods every spring. The first flood, which is of small note compared with the second, comes on in April—the great flood in June. From this cause I infer that there are not many large lakes in the courses of these rivers, and that their sources are more northerly than those of the St. Lawrence; for were there large reservoirs to receive the waters of dissolving snows, then there would be but one flood, which would keep rising, as the altitude of the sun increased, so long as any unmelted snow remained in the region valleys, as it were, of these rivers.

The April flood arises from the early action of the sun on the southern regions: all the small drainers flowing in from the south, are flooded to the brim; while those coming from the north and north-west, are almost unaffected by it;—and these are of much more extensive dimensions; they have to await the progress of the sun for nearly six weeks longer, before they are set in foaming commotion.

The thaws are not attended with much rain generally: the sun is partly obscured with a very luminous vapour,—a kind of hot mist, if the term might be used: such weather dissolves ice and snow sooner than if the sun was unobscured by clouds, or if torrents of rain fell. The floods which fall

into Hudson's Bay and the North Pacific Ocean, are not at their height until the middle of July. The more elevated the sources of rivers are, the greater, of course, will be their velocity; and those having the greatest velocity, have the straightest courses. Serpentine rivers are all of small elevation; the banks never rise high; but in the other case they do, as where the greatest currents are, the deeper is the channel's ground. The elevation of the banks of a river at the bottom of a rapid, is generally equal to the height of that rapid: this is a natural consequence from a rapid forming through a succession of ages in a country of table lands. If a river, then, has two floods at periodical times, and the days between those times are known likewise, the quantity of water in each flood, and the velocity, together with the quantity and velocity when the river is at the lowest,—"the length of it may be nearly obtained from the main source to the point of discharge, and the elevation of the said source above said point, with the general course of the river." Such information is useful, before we set about exploring a wild river which no one knows any thing about; and many such rivers there are in Canada. The Ottawa for instance, which is larger than all the rivers in Great Britain, were they running in one, which

divides the civilized parts of Upper and Lower Canada, and forms the great highway through the interior of the country, is, I may say, quite unknown. Raftsmen penetrate and procure some of their timber for market about three hundred miles up it; and fur-traders pass from it into Lake Neppising, and from thence into Lake Huron, when going to their great Indian territories. Thus, there is one of the largest and noblest rivers in the world running through the heart of one of our greatest colonies, and yet we are strangers to it: few have the means to explore such a river alone, and those who have will never attempt it. In the absence of all farther information, I should infer, from observations made with care, that the most distant source of this large river is in that tract of country between Lake superior and Hudson's Bay; that there are few large lakes in its course; that its utmost length is about 1800 miles, and its elevation above the ocean, nearly 1100 feet.

The lake ice, freezing to the thickness it does, cannot be supposed to remain level; it swells and gently curves upwards, when enormous cracks from side to side take place along the crown of the curve. The roaring of these cracks when forming was a sound such as I never before heard;

it was not at all like thunder, except in loudness; it might probably resemble the sound of cannon fired in a wide rocky cavern. These cracks open upwards, and are dangerous to be passed with horses and sleighs; they yawn, as it were, to receive them. When the thaw comes on, large tablets of ice, formed by these cracks, sail about the lakes from side to side, according as the winds or currents prevail, trending always toward the outlet, where there generally is a rapid: away they tumble, and are broken into a thousand fragments, while they vault down the roaring *chute*, turning up their transparent glories to the gleaming sun. After the ice and floods have passed away, large round stones are sometimes found at the bottom of these rapids: they are generally of quite a different nature from the rocks which compose the banks or bottom of the river. Some think that they are conveyed on these ice-floes from the sides of the lake, and hurled with them down the rapids. I think also that they are indebted to the frost for moving them about; but that they have not fallen from the banks upon the ice-floes, as suspected, but are taken up, by being frozen into them, from the shallow shores of the lakes. When the floes are compelled to move before the floods, they take

the boulders with them, like plums in a cake. They are chiefly formed of hornblende and gypsum, and are not unlike the potted head-stone, well known to the Scotch curlers. On the shores of the great gulf of St. Lawrence we met with boulders of an enormous size; many of these detached stones could not be less than twenty tons. These are quite a different kind of boulder-stone from those we have been considering: they are, ten times larger, and not to be found on the shores of any of the lakes, nor by the rapids of any of the rivers. What their component parts are, is beyond my mineralogical skill, but the specimens brought home may elucidate them. The colour is very black grey, having pointed particles of a brilliant nature; they are very hard; the blocks without veins, generally all of one colour; those which deviate in this respect incline to brown. There is evidently trap about them, but altogether I have seen no stones like them. What cause has brought them to where we find them, is hard to say, or even where they have come from, as the rocks of the Gulf shore are generally a slaty lime stone. To venture a humble opinion, however, methinks they are some of the products of the arctic regions, and therefore I shall call them, until we find out a more proper name, the *arctic*

boulder; and that they are frozen into, and conveyed to the Gulf shores by the icebergs, or thick-ribbed ice-floes, which visit the Gulf every season, where some of them are left on the shore after the ice is dissolved. At low-water mark I found the largest; the smallest are found higher up the beach: from which I would infer, that the largest come in the largest floes, and these require deeper water to float in, and that those of the greatest magnitude are probably deposited where the water never ebbs sufficiently low that they may be seen. Independent of there being nothing valuable about them as minerals, that is to say, nothing to please the lapidary and man of commerce, still, to the naturalist, they are gems not to be sneezed at. If they come with the Polar ice, as I have every reason to think, they come from where the eye of the most intrepid man will never see them, perhaps from under the Pole itself: bowled, as it were, by the hand of the frost, on a theatre where they may be inspected: a curiosity conveyed by Nature in a singular manner, from dreary, frigid regions, for us to look at:—and, laying poetry aside, they seem to be, after all, the best of mill-stone metal.

Amongst the ledges of limestone which occur in the neighbourhood of rapids, there are round

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holes discovered, some of which are two feet in diameter. When they happened, as they often did, to be in quarries opened for the use of the public works, the quarriers, after a time, came to the bottom, and found a round stone there in each, of a very hard nature, like a cannon-ball, of six inches diameter. These boulders were of a flinty spar, of a yellow colour. Sometimes the holes would reach twelve feet in depth, quite perpendicular, bored through the limestone strata with great regularity; and the blocks of stone raised off the holes had a singular appearance. But what may seem strange, although these holes generally began at the surface, they were sometimes met with beneath it, in the heart of a solid lime-stone stratum, more than ten feet down. On examining the matter minutely, it was always found that a crevice led from some part of the hole, between beds of strata; and where this crevice ended—which might have been five hundred yards off, for any thing that appeared to the contrary—we never knew. From this I inferred, that Nature made use of many kinds of machinery, in order to grind away the rocky banks and channels of her rivers, so as to give work to her various agents.

The bullet-stone found in the hole was evi-

dently what had ground it, by a pressure of water whirling it round like Barker's mill, and then escaping out of the crevice. A mass of waters passing down a rocky channel, would be a long time in grinding it deeper, or forming a ledge so as to have a fall; but millions of unseen grinding-mills, at work as described, are able to make great alterations. Where we found these holes in greatest abundance, was fifty feet above the present bed of the Ottawa. The Falls of Chaudiere, which are now thirty-one feet in height, were evidently once as high as the Lake of Chaudiere, which is sixty-four feet above the level of the present water below the Falls. How long these thirty-three feet have been grinding away, it would be difficult to say. Old Indians state, that they have gone with their canoes where they cannot go now; that the passage of Chaudiere is more difficult to *make* than formerly; they will even point out the ancient passage of their fathers: however, the data of tradition do not satisfy mathematicians.

All frozen lakes, toward their outlets, have what are called their breathing-places. These are of great extent, and although seemingly tranquil, never freeze. They are evidently, however, subject to tremulous motion from the action of the

frost on the lake, and from the surplus waters smoothly discharging themselves.

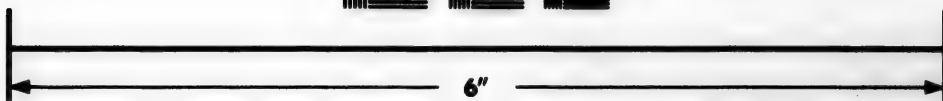
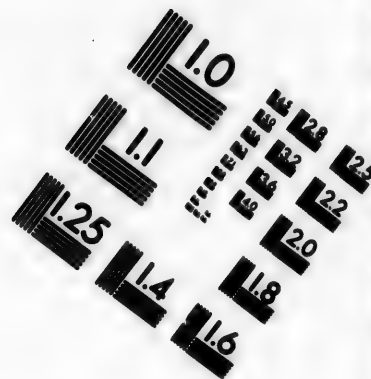
The "treasures of the snow" are wonderful; we may peep at, but cannot "enter into" them: it is ordered to be on the earth, and "out of whose womb it comes" even Job himself durst not say.

It has been thought that we are going to lose in some distant day our grand Canadian rivers; the St. Lawrence and Ottawa begin to dwindle:—so the natives will argue, and will point out marks on the banks of those noble streams, where they remember the waters at Midsummer to have had their margin. These marks are several feet above the present Trinity data. A few feet higher are the marks of the grandfathers, and higher still, those of the great-grandfathers. Thus do the banks of the rivers afford a scale whereby the generations of mankind may be numbered; by them we may know nearly the exact age of the world, and quibble no longer with the Chinese, or any other nation, about the time

"When Adam delved and Eve spun."

Now the truth is, that the beds of the rivers are always changing, but the rivers themselves





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remain as they have probably done from the first formation. The rapids grind down the rocks over which they roll, leaving the still lake to cover the spot where they once roared; yet neither does the number of the lakes nor that of the rapids diminish in consequence. Niagara Falls and Lake Erie may translate themselves, but will never be annihilated: for how can they, when the height of the head water remains the same above the level of the ocean, whither they are ever descending? We may, therefore, draw a conclusion from this, that if the lakes and rapids of any Canadian river become fewer in number than they are at present, their dimensions will be larger, and in the course of time there may be waterfalls in Canada to the height of five hundred feet.

THE LAKES.

THESE are many in number, and several of them of great extent, as is well known. The waters of those which may be said to belong to the river St. Lawrence, are very pellucid. On a calm summer's day, a white object of about one foot square may be seen to a depth of about forty feet. The waters near their shores are neither so clear nor so pure as they are towards the middle: some argue that they are not very wholesome to drink, but this, I think, is incorrect.

Lake Ontario is about 183 miles long, 42 miles wide; in some places, more than 450 feet deep, and 220 feet above the level of the tide waters of the ocean; consequently, in some places, it must be about 230 feet below the level of the ocean. The water is very fresh-tasted, and allays thirst very well. The wind blows strong on the lakes sometimes, and the waves are of that short, jump-

ing nature, so disliked by sailors. When much agitated, a small boat finds great difficulty to live amongst them; the ground-swell, and the shore deflection, create a most singular kind of undulation. The oldest salt-water sailors will frequently get sea-sick on them. There are no tides on any of the lakes, as reported,—none, at least, from the moon's influence; the floods of spring generally raise them from three to four feet. It is said that Lake Ontario rises once in every seven years higher than it usually does, by two feet. The people ascribe this to some supernatural cause. In the spring of 1827, it had one of those periodic tides, rising nearly three feet higher than it had done the previous year, and keeping high the whole summer. Being in the neighbourhood, I paid the utmost attention to the phenomenon; and found that there fell during that summer much more rain than had fallen for many years before; that there was little sunshine throughout the season, and consequently, I concluded, the exhalations from the lake were not so copious. There was another circumstance which puzzled me that season. Lake Ontario, and, indeed, all the lakes, were up at their very highest surface-marks, but the rivers flowing out of them were not. These surface-marks are very obvious on

the rocky shores of all the lakes ; they are drawn, like so many chalk lines, by Nature herself.

Rivers do not rise exactly from the same cause as lakes : if in spring the snow melts off the country on a sudden, and the frozen swamps break up and disembody their contents, then the rivers swell to their utmost height, as water pours into them on all sides by gully, vale, and creek ; but when the sun has effected this, when the snows have been dissolved, and hurried down with the contents of the swamps to the ocean, the rivers begin to fall. The lakes swell, it is true, from the same cause, but not with the same comparative haste ; their surfaces being of great extent, the floods can only spread over them by slow degrees ; and if the sky keep cloudy, and the weather moist, so that little evaporation is going on, the surface of the lake will continue to swell, while that of the river will fall, as the country on either side is drained, and nothing tending to keep up its flood but the mere discharge from the lake ; but while the lake keeps up, the river will not fall so low as it would were it down ; it will continue as it were, for the season, under the influence of a partial flood. Rivers and lakes are, therefore, never at their utmost pitch of flood together, neither are they ever at the

lowest ebb at the same time ; for when the floods of a river have subsided to a certain extent, the intense heat of the sun, acting on the shelving sides of rocky channels, and even on the rocky bed of the river itself, tends greatly to promote the absorption of the waters ; whereas, in the deep wide lake, this action cannot take place. Hence the quantities of water which immediately flow from lakes into rivers are greater than at the points of discharge, so long as hot sunny weather continues ; there is much more, as it were, flows into them, than flows out.

Lake Erie is about 270 miles long, and may nearly average about 25 in width ; it is considered to be about 220 feet deep in some places, and is generally laid down by the American levellers at 565 feet above the tide waters of the ocean at Albany. But this I consider rather too much ; for, by even allowing the medium rise of tide at Quebec to be twenty feet, I can only bring the level of this lake to be 570 feet ; and by the Albany tide-table, I find ten feet difference, making the height of level 560 feet, which is five feet less than the Americans make it. However, as none of these beautiful and extensive lakes have yet been surveyed with that care they deserve—a thing much

to be regretted—little differences will occasionally occur in the calculation of casual travellers.

The Lakes Huron, Michigan, and Green Bay, have been considered all on one level. Lake Huron is strewn with beautiful large and fertile islands; it is generally considered to be about 250 miles long, 120 miles in width, 860 feet in depth, and 590 feet above the level of the ocean. Now, as there seem to be about 370 feet between the level of this lake and Ontario, in some places then, (if all soundings be taken correctly,) its bottom must be 490 feet beneath the surface of Ontario, so that their bottoms may be considered not far from a level. Lake Ontario being, as I said before, about 450 feet deep, if any subterraneous passage exist between those immense sheets of water, the one having a *head level* so much above the other, a quantity of water will find its way into Lake Ontario, without tumbling over the Falls of Niagara. That such a passage may exist is merely one of my own conjectures, deduced from the above data of heights, depths, floods, &c., and from observing, that the proportion of waters that come over the falls, is less than one would reasonably expect from seeing the discharge out of Lake Ontario.

The noble reservoir and head fountain of all, Lake Superior, is accounted to be 480 miles long, 420 wide, 930 feet in depth, and 1050 above the ocean. Numerous streams fall into it in all directions: and its shores are generally composed of fine sand. When the fur-trading canoes are caught on it in a storm, they fly into the creeks for safety, and the mouths of these are often shut up with the fine drift sand, and the water dammed up above its natural level. When the storms abate, a slight rut is made through the sand-bank; and out runs the water, forming a channel wide enough to let out the laden canoes in a very short time.

These great lakes of North America seem to answer some of the ends that the mountains in South America do; they are the means of watering extensive territories. The Andes attract the vapours ever rising out of the huge oceans on either side of them, by which means their great rivers are supplied; while the lakes, by evaporation, do the same thing. Hence, where there are large mountains on the globe, there are no extensive lakes; and *vice versa*. It is singular too to remark, that the loftiest mountain is generally found to be the farthest inland, and also the most capacious lake. Chimborazo stands in majesty

towards the centre of his realms, while Superior is an ocean in the heart of a splendid wilderness. A hill, or a pool, in such places would, so far as we may judge, produce thirst and sterility. Turn where we will, observe what we can, we must acknowledge and adore the wisdom of Providence.

Once while on Lake Ontario, I dropped a letter to my old friend; perhaps it may be acceptable in this place.

“DEAR SAUNDERS,

“WEARIED out at York, I flung my *corpus* aboard the first schooner that dared this year to navigate Lake Ontario, and away I came. A puff of wind run us out of the harbour about forty miles, and then came on a calm, and the most wonderful scenes of refraction ever beheld by man. Refraction, thou knowest, is a kind of game that the light indulges in occasionally—optical delusions, or the whims of the French *mirage*. Islands turn upside down, while the trees depend on the tops of those below—tops to tops; the white surf of the ground beach swells, is also translated aloof, and seems like the smoke of artillery blazing away from a fort. At one time we fancied ourselves in the midst of a splendid ewer, water pouring in all directions round to the seeming depth of

twenty feet; again, the distant American shore would rise above a sheet of something like a white haze, then would it fall away again out of sight, while large mountains of water would seem to swell up on the horizon. But I am rather getting *Brewsterized*, so shall content myself some morning with explaining these spectacles. They arise from the state of the atmosphere and the condition of the surface of the waters. When long, smooth, oily tracks, as formed by the spawn of fish, are surrounded by what sailors call the cats-paw or ripple, then begins the gambol of light, changing with the undulating waters.

"When night came, it brought wind, rain, thunder, and all manner of stormy materials; so we bared our sticks, and were driven in with a vengeance to the harbour of Presqueisle.—Coming to anchor in the morning, I espied some ducks near the head of the bay, seemingly very impudent; so I went ashore, like Robinson Crusoe, with a gun over each shoulder to salute them. I rattled some slugs amongst them, seemingly to their amusement, for they were too far off. I therefore had recourse to a method taught me by Dr. Dunlap, which is, to send a bullet into the flock with one barrel, and then meet them on the wing, as they come overhead, with the other,

well filled with small shot. By this plan we had some black ducks for dinner.

"The wind drawing south, we set out to the lake again. How pure are its waters!—what a luxury to drink, and to wash one's face in the morning! The lakes are the reservoirs that purify the St. Lawrence, and water the huge continent of America. At length we ran the extent of the lake, and found ourselves becalmed once more amid the Thousand Islands. These brought the vision of Mirza before me, and I felt something like what people term poetry entering my mind. If you had been here, Saunders, you would have been raving in rhyme like a mad bard, and frightening the skipper of the boat, honest lad, who sat beside me by the tafferel and whistled '*Blow, breeze, blow.*'

"On the bank of one of the islands my eyes, roaming about, met with the solitary grave of some poor individual. This was one of the thousand instances I have observed of the want of proper respect being shown to the dead in Canada. I like to live, said I to myself, very well in this country, but I should not like to die here and be *buried*: for, spite of all the immense tracts of land there are here, a poor fellow cannot have so much of it at the last as will make a grave for him. The

churchyards are always placed in the most barren, sterile, rocky spots that can be selected, seldom or never fenced in, but left to the mercy of the pigs and geese, the former to grub, the latter to gabble. Shame that things should be carried on in this way ! I like to see the dead attended to as well as the living. How pleasing to find people weeping over the dust of their departed friends !—how easily do we enter into their feelings and weep with them. But I am getting melancholy, and there is a melancholy peculiar to Canada. There many strangers meet from many nations : in a great wilderness, reflection begins to work ; while the songless birds and hollow sounding waters add to the sombre situation of the whole.

“ To counteract this, the Canadians have their boat-songs and their convivial meetings ; they laugh, they live in herds together : for this they have their *bells* upon horses to cheer along the caravan of sleighs, while they travel their long snowy journeys.

“ But, Saunders, I find I am getting out of my latitude ; far too serious to-day ; yet, though in a *doldrum*, still your friend.”

THE FOREST.

THE enormous extent of Canadian forest has baffled naturalists to account for its general utility. Trees of various kinds are to be found thickly growing together for thousands of miles. That they serve to allay the severity of climate, is surely one of the uses for which they are intended; it neither being so hot amongst the trees in summer, nor yet so cold in winter, as it is in the cleared country. In the former season, the rays of the sun are chiefly withheld from the soil by the leaves and branches; and in the latter, the cold which is generated in the atmosphere is also prevented by them from darting down and freezing up the pores of the earth: they may, therefore, be said to act both as a shade and covering. When rain falls, they imbibe and retain more cooling moisture than the land would do without them; hence the many springs we find

in the woods. Perhaps the rivers and lakes will become affected differently, if once these immense territories are shorn of their trees ; some of them may dry up altogether in summer : although this is a question, there being more rain in the cleared than the uncleared countries, and less snow. What is termed cultivation, does not improve climate, in my estimation. The United States of America were more salubrious sixty years ago than they are now. The laws of Nature, when too much disturbed by the hand of man, are apt to retaliate to his injury ; disease and sickness seem to follow those, or their descendants, who annihilate the stately forests.

The Americans, as they are termed, are not a healthy people ; they are evidently much degenerated and degenerating ; so are those in the cleared townships of Canada. What a difference between them and the athletic Indian of the wild ! We are certainly acting diametrically against the laws of nature by levelling the forest, but not improving it by any means. Before Europeans arrived in America, there were as many people, and some will say more, in it, than there are now ; these existed, and what are left do yet exist, without cutting down the trees ; yet it seems we cannot get on now at all, without going through this

fatigue with the hatchet. Our wish seems to be to despise the good things which the country naturally affords in abundance, and to introduce into it, with much care and labour, those things which we and our forefathers were accustomed to. We cut down the beautiful umbrellas that Nature has prepared to hinder the sun from glowing upon us; we frighten and extirpate the game which breed and thrive so plentifully in the woods. Where are the herds of deer, and flocks of turkeys now?—they are retired with their friend the Indian to the remote territories. And where are the fish that gambolled in the shady pools?—why, the pools are dried up in the summer's drought, and the trout are no more. Where, then, are our boasted improvements?—for my own part, I do not know where to find them. I can see as many beauties in the forest,—in truth, more than in the cleared and cultivated country; and had I been an Indian instead of a Scotchman, there is no doubt but I should have seen many more—and an Indian is as good a man as I, and, I would hope, much better. We are taking, and have taken, large domains from him for the purpose of extending our race and multiplying it over the face of the earth; in fact, we are labouring to extirpate a set of people as good as ourselves, even much su-

perior, and thus evidently subverting the order of Nature. We think our way best, and will have it best, be the consequence what it will. We cut down the woods, and set the plough and harrow to work, that bread may be produced ; we spread our arts, manners, morals, and learning over the world, for we are right, and all others are decidedly wrong ! —we are the only people regularly enlightened of the race of Adam ; all else are in the dark, and their situation is miserable ! Just so, boasting Civilians ! Wretched is the lot of the poor savage, according to you, both here and hereafter : but many others besides me have met with him in this world, more happy and contented than you are, with all your refinements and exquisite comforts ; and, as far as humble mortals can judge, as befitting subjects as any of us for entering the kingdom of Heaven.

But, laying these speculations aside, let us examine the trees of this Canadian forest, and see what stuff they are made of. The oak is not so enduring a wood as that of Britain ; the fibre is not so compact and strong. It grows in extensive groves near the banks of some of the large lakes and rivers. I have seen it square to two feet six inches, and fifty feet in length ; but such a stick of timber is rare. The medium is about eighteen

inches, and of the same length as stated. It will endure the seasons, when put in work, for about fifteen years; it will not swim by itself in logs, being more than the specific gravity of water; so the rafts of oak are bound up with cross-bars of pine, that they may float down the rivers and lakes to market. When a raft of oak arrives at a water-fall, it has to be dragged past it by oxen or horses on the land; for, if allowed to run over as other timber is, when it broke up in the cataract and boilers, it would sink. It is a timber easily squared by the hatchet, answers for ship-building and heavy work well, and does not decay in England so soon as in Canada. There is another kind of this oak, called scrubby oak, which grows on rocky hills:—the wood of this is much like the British gnarly oak; it is difficult to work with the hatchet, but of a very durable nature, and might be employed for many useful purposes. The worst species for art or commerce seems to be the swamp oak: it grows in marshy places, is full of branches, soft to work, and irregular in form: the butts are often found very thick, and when water-soaked, that is, in a certain state of decay, it would be found extremely useful in forming wharfs and jetties, in sandy bays where there are no stones, and where piles will not drive.

As it is extremely heavy, and might be packed like sacks of coal, I have often recommended its use in the construction of the harbours of the lakes, where it surely could be employed to much advantage. The quantity of good oak in Canada is great, and might furnish navies for Britain as often as she required them; for this alone, in a political point of view, the colony ought not to be lost sight of; but we have ever been endeavouring to oblige it, (and for our own benefit at some time, which is all perfectly right,) without making those diligent inquiries that we ought, regarding the best method of acting. What we have hitherto done, has been to her and our own injury, as I shall prove elsewhere. The pine grows on sandy soils, which are considered not good for agricultural purposes; and this I consider a blessing, as pine stumps being full of resinous matter, will not quite decay in less than twenty-five years; therefore, the farmer on the good land is not troubled with them. White pine is the most common timber in Canada for mercantile purposes; it is found chiefly in large quantities growing together, called pineries. I have seen it square to three feet, but the medium is about twenty inches, and sixty feet long. It is not of a very durable nature; in Canada it is far gone in six years, but in England

pine is generally not of such large growth as the white. It is a very useful wood, and much used in house-building; it has a considerable quantity of resin in its composition; as a valuable wood it stands next to the oak.

The pitch-pine is the same with that well-known tree called the Scotch-fir: it has much resin, which is extracted by cutting into it about three inches; no resin is near the heart of the tree. Sometimes, in Canada, this wood goes under the name of the Norway-pine: it is seldom wrought into any thing. Besides all these pines, there are various firs and larches of small growth met with, according to their soils. The spruce-fir is very common, and furnishes materials for spruce-beer, a beverage in high request amongst the Canadians; and spruce knees, which are the roots of this tree, are found to be a good substitute for crooked oak, in boat and ship-building.

The pine is the loftiest tree that grows in the forest; it looks down on the oak, and is often to be seen nearly a hundred feet high before a branch appears. I have seen it tower to near two hundred feet in height. Travellers tell me that beyond the Rocky Mountains, towards the Pacific Ocean, they have met with them much higher than this,

and girthing fifty feet; but these things are not all to be believed: let the tape or foot-rule be applied, and these will tell the truth.—The fir species is more numerous than that of any other tree.

There are many kinds of ash—the swamp ash, white ash, and prickly ash, all varying according to soil: it is not a very serviceable wood. The prickly ash is ornamental, of a wavy nature; tables and furniture for houses are made of it, which look very well; it produces a berry considered to qualify bitters extraordinarily, as will elsewhere be considered.

Black and white birch are very useful timber, and tolerably plentiful. It is with the bark of the white birch that the Indians make their beautiful canoes.

The beech, elm, sleek-skinned and shaggy hickory, are very common on the fertile soils, along with maple, curly and sugar maple.

The curly or bird's-eye maple makes beautiful house furniture, and is an ornamental wood highly prized: a figure like a bird's-eye is brought out on polishing, which looks beautiful. From the sugar-maple the sugar is derived, a process elsewhere to be considered.

Butter-nut is also a tree which furnishes ornamental wood: it is not a large tree, and has many

Directly
to the
point

branches, knots, and holes, in which squirrels lodge. The nuts are as large as hen-eggs, rough skinned, of an olive colour, and taste something like butter. Iron-wood may also be accounted one of those which grow on what is called hardwood land: it is neither a thick nor a tall tree, about the size of hickory, and may be converted into a useful wood for many purposes.

In the deep gullies we meet with the white sycamore and button-wood tree. In the marshes, alder, spotted alder, willow shrub, and a variety of thorn appear; and in the swamps, red cedar, tamarack, hemlock of many shades. From the tamarack the gum is extracted with which the Indians make water-tight the seams of their canoes. The hemlock grows large, but often with a hollow heart; it is a useful wood for house frames.

There are great varieties of shrubs; the shumack may be accounted one, and also the leatherwood tree, of which beautiful hats are manufactured. The briars are of numerous kinds, as wild raspberries, black-currant and gooseberry.

Wild plumb, apple, hazel, walnut, and cherry-trees are in abundance; while the vines, like the ivy, twine luxuriantly round the aged cedar of the loamy marsh. Barrel-staves are made of oak and pine; hoops of ash, and withies of birch. This

subject would require a learned botanist to explore it; the world, however, must accept such as can penetrate through thickets, albeit they may not have Linnæus every moment at the tip of their tongue: it is difficult to carry a college about on one's back everywhere; and probably by attending too much to classification, genera, &c. broad views of the subject are often overlooked.

The *bush* is the native title of the boundless forests of Canada. How different from a mere shrub, as the English language has it! Is the term from the French *bois* (wood)? or where is its root? The matter is worthy philosophical consideration. To the bush goes the settler, hungered out of the old world, and there he finds food for his family. To the bush goes the lumber-man, and there is a supply of timber for the Quebec market for ever and a day. To the bush goes the furrier, and there are his otters and beavers, the muffs and the tippets. In exploring the bush, a person fancies at times that he has got into complete solitude: he bustles along, and the rustling he makes in getting through the brushwood, deafens his ears to other sounds, while mosquitoes, &c. are too apt to obscure the functions of the eyes; but let him listen a little, and various singular sounds meet the ear, as

do also strange prospects the eye. Birds fly about, screaming piteously, as if their nests had been lately robbed: these remind us of the lapwings in England. None of the feathered tribe in the woody wilderness perch upon boughs, and warble sweet notes; no linnets, no nightingales there: the music is melancholy, the cadence is sorrow, creating similar sensations in the wanderer. Partridges there sit on the branches, and there is the robin redbreast as large as a thrush, yet a much greater coward than the British robin; he turns tail on the proffered crumb, and fears to enter the most hospitable mansion, although the doors may be flung open to receive him. In the bushy hemlock the owl is found dozing; while the swamps croak with bull-frogs and bitterns. During the cold frosty nights, the trees creak, as if ten thousand *bûcherons* were at them with their hatchets. On the banks of the wild rivers, are curious trodden paths—these are the walks of the wolves, foxes, deer, &c. These roads the Indians always adopt, when on their journeys. Places called *deer-licks* are also frequent: these are salt-marshes, where the deer assemble to lick the saline soil. Hunters looking for the animals await them at these marshes with their guns, and shoot scores of them.

The bush is an interesting scene. There is, as Byron says—

“ A pleasure in the pathless woods.”

When a man loses his way, he follows down the first running brook he comes to, and this never fails to conduct him to the banks of some river, where he generally may obtain information of his situation. The Indian writes his letters on the bark of a tree, and places them in some post-office well known to his tribe; which post-office is, generally, an old hollow cedar. Thus they conduct their business in the bush, and breathe sighs to their squaws from Lake Simcoe, perchance, to beyond the Rocky Mountains.—Think what ye will, ye denizens of gay luxuriant cities; ye who boast of your wealth, your wines, your comforts, your society—give an honest Canadian a bit of pig, his wife, and his pipe, and he is as happy in the bush as you are; and treads his brushwood-way as pleasantly as you do a Turkey carpet.

RIDEAU CANAL.

EVERY man to his business; and this being mine in Canada, of course I am more at home on this than on any other subject. It claimed the greater part of my attention while in the country, and by confining me to it, prevented me from exploring much, which I should otherwise have done; yet, by this very confinement, I was better enabled to examine things minutely; and the statements about to be given, will form safe data for various deductions, which may be applied to the whole of North America.

The two great rivers of Canada, viz. the St. Lawrence and Ottawa, meet at the Island of Montreal; the former forming the south boundary, the latter flowing through the interior of Canada, and dividing the Upper and Lower Provinces. There are great rapids on both rivers;

and during the Canadian wars, it was found extremely difficult to get stores dragged up the St. Lawrence, to supply our forces on the lakes ; the rapids and the enemy greatly hindered the forwarding of the necessary supplies along the frontier. On the return of peace, various methods were proposed to remove this obstacle, by canalling the St. Lawrence, constructing better roads, or connecting a chain of small rivers and lakes, that lay between Lake Ontario and the Ottawa river. The last of these methods was considered the best ; since, if found practicable, it was conceived that it might not only answer for transporting stores safely, either in times of war or peace, but might also be the means of opening an important tract in the interior of Canada. Various persons considered capable of forming a proper judgment of this scheme, were sent through the route to report on the same, by orders both of the Provincial and Imperial Parliament ; and all accounts seeming very favourable, the construction of the Rideau Canal, by the latter, was determined upon. In the autumn of 1826, I was ordered to make a survey, and after a very fatiguing task, reported thus to my worthy commander, Lieutenant-colonel By.

" Wilderness of Rideau.

" December 28, 1826.

" DEAR SIR,

" HAVING by your orders explored the country in all directions, between the Bay on the Ottawa river, called Rafting Bay, in lat. $45^{\circ} 30'$ north, long. $77^{\circ} 20'$ west, where the Rideau Canal is proposed to commence, and the sheet of still water at Captain Wilson's, being a part of the River Rideau, embracing in the survey an interesting tract of country about eight miles long and four broad: I feel disposed to report to you as follows.

" From the level of the low water in the Ottawa river to the head of the entrance valley which runs into Rafting Bay, in the above river, the height is eighty-three feet, which is proposed to be surmounted by locks and a basin to eighty feet; the distance from the shore of the entrance bay, to this summit-level, is 1090 feet. A distance of six chains farther brings the Canal into an extensive beaver meadow of about twelve acres, where a beautiful basin, or lay-by, may be constructed. From this place the route of the Canal leads gently away in a southerly direction, on the line of a number of small swamps, which have their origin in the beaver meadow, until it comes to a celebrated spot called the Notch of the Mountain, a distance of

about three miles. Throughout this part of the route the levels are extremely favourable, and a natural gully greatly assists our business. The Notch of the Mountain is a break in a ridge of hills, about seven chains broad ; the hilly ridge is about thirty-four feet high, and runs east and west ; east about three miles, and west half a mile : a place seemingly designed by Nature to allow the Rideau Canal to pass through. On the west side of the ridge the swamps fall away rapidly towards the Bay of the Chaudiere. After passing through the Notch, the summit-level holds good for a quarter of a mile, when a sudden depression takes place into Dow's Great Swamp. This swamp runs directly across the township of Nepean from the River Rideau to the Ottawa. The ridge of mountains, already spoken of, terminates here on their western extremity, and forms a partial ridge across it, sixteen feet beneath the summit-level, dividing the swamp, so that two-thirds of it fall into the Rideau, and the other third into the Ottawa above the Falls of Chaudiere : when the floods in the Rideau rise above sixteen feet, a part of them naturally fall into the Ottawa. The plan, however, as delineated, will convey a clearer idea of the extent and nature of this. Where this swamp falls into the Rideau, below Stegman's Falls, it is more

than a mile broad ; and where it falls into the Ottawa it is much broader. At the spot which we have termed the ridge of the swamp, it was expected that the canal might have been carried over ; but, as it lay so far to the westward of the line, it was thought prudent to save distance, and hold on directly through the swamp, where it is thirteen chains broad, and averages thirty-two feet deep beneath the summit-level. Although this extensive swamp may be considered a great obstacle in the way of the canal, I am inclined to think otherwise. As there was no possibility of avoiding it, the closest examination took place in order to discover some method to cross it in a tolerably easy manner ; an account of this method I shall soon give, after explaining another point, which seems to be much connected with this swamp, and which no surveyor could fail to pass without noticing.

“ A swamp of this nature, lying directly between the Rideau and the Grand River, a distance of four miles and a half, seems to be a favourable line for the canal ; but, on farther examination, we find that the currents in the Ottawa, below the bay called Bellows Bay, are very much against that supposition ; and, as the swamp below Stegman's Falls in the Rideau is only forty-eight feet above

the Ottawa, there is fifty-two feet to surmount before the still-water at Captain Wilson's can be gained. If, therefore, a summit-level of eighty can be any way preserved from Rafting Bay, that route is surely the most advantageous, as it always holds its place in the elevations of the rapids of the Rideau. For, as the difference between Captain Wilson's still-water and the waters of the Ottawa, beneath the Falls of Chaudiere, is one hundred and ten feet; that height must always be surmounted, whatever plan be adopted. If locks are not constructed on the Ottawa side of the country, they must be on the Rideau side; the same number being necessary, according to their lifts, whichever side they be put on.

“ Having stated thus much, I proceed to explain the method which seems to me the most practicable for crossing the swamp; although in so doing I may incur a little ridicule. The plan, so far as I am aware, is new, and has never been tried before; but the situation of the place, and many other circumstances, justify the method proposed. At first view, one would suppose that a mound of earth might be formed to carry the canal over, or that an embankment of thirty-four feet, with another smaller one at the ridge of the

swamp, of sixteen feet, would answer well, and form an extensive sheet of water for boats to rest and pass one another between them; but, after considering a little, we find, that to raise such embankments would be no easy matter, and would consume much money. An aqueduct of wood would be much better, and an aqueduct of wood I propose. Instead, however, of supporting it on piles or arches, as is the case commonly, I propose that the heads of the cedar-trees, which grow as thickly in the swamp as they possibly can grow, and average fourteen inches thick, and seventy feet high, be sawn off to the proper level, in the route of the canal, so as to form props for the bottom, sides, and towing-path. Upon this foundation, with clay, puddle, and planking, I consider there can be little difficulty in carrying the canal over, as is shown in the design. A cedar-tree, when cut down, will remain fresh fifty years; and surely, a tree standing on, and fixed by its roots, is a stronger and steadier support for an aqueduct, than any pile of the height requisite, let it be driven in the best manner possible. Nevertheless, the idea of carrying a canal over the trees in Canada, may raise the laugh against us. However, it seems the best plan I can suggest, though you may probably devise some-

thing better still when you see the place—a place which cost us much trouble to explore, owing to the cold weather, thick brush-wood, and the waters in the swamp not being strong enough to bear a person properly.

“A stop-gate will require to be placed near this aqueduct at the swamp, so that the water may be let out of this part of the canal during winter, that the frost may not injure the works. At this place too a junction may take place with a branch-canal coming from the Lake of Chaudiere, on the Ottawa river. I have taken the level up to this lake, and find it to be only thirteen feet beneath the summit-level, which is, as stated before, eighty feet; so that the Lake of Chaudiere is sixty-seven feet above the waters of the Ottawa, under the Falls of Chaudiere. From this swamp to the lake the distance is about five miles, and almost level; so that with two small locks of seven feet lift each, and this distance of five miles of canal, a navigation may be opened for forty miles and more up the Ottawa, into a fertile country, now rapidly increasing in population. To do this will be much cheaper than building locks to lift sixty-seven feet, and cutting six miles through a rocky country; which would have to be done if ever the Falls of Chaudiere, the Rapids of Du Chene, &c.

be surmounted as proposed; and if a junction cannot take place with the Rideau Canal and the Chaudiere branch in Dow's Great Swamp, I know of no other place where it can be accomplished without much more trouble and expense; since, to join at Captain Wilson's, the distance is thirteen miles, and difference of level forty-three feet. At some distant day, perhaps, the Mississippi Lake and the Rideau Lake may be united; but the Rideau Lake, by Mr. Clowes, is two hundred and eighty-seven feet above the Ottawa: so here is two hundred and twenty feet between the Lake of the Chaudiere that must be surmounted, before that takes place,—a thing that will not be done for a trifle. But to return to our subject.

“After the swamp is passed, we come upon a dry flat of land, averaging eight feet beneath the summit-level; and instead of raising an embankment even here, we propose that the aqueduct should continue over it for ten chains farther, and, as the trees grow thin upon it, we propose to bring cedars out of the swamp for that purpose. As this aqueduct is embosomed in the wood, it will be endangered by fire; and to insure it against the casual flames of the forest, we propose that the wood shall be cut back from it on each side for the distance of four chains, and that this wood be

appropriated for constructing the aqueduct. Having finished this wooden fabric, one hundred and fifty chains more bring us to the summit-level, which we no sooner gain, than a ridge of high land presents itself before us, and a gully running up into it, which I have termed Likely Gully, because we here fancied that we could lift to the summit-level of the still-water at Captain Wilson's, by placing three locks together in this gully. But after having risen to this summit-level, and explored the country in all directions, both with the level and without it, I found that this country ascended much, and formed, what is termed, the Mountains of Nepean. At one time we were upwards of sixty feet above the summit-level, and fell into the still-waters, where the banks were at their lowest, at thirty-five feet above the summit. This was at the mouth of Cockburn's Valley, a great gully, or drainer, two hundred feet wide, running to the south-west, and draining the swampy uplands.

" Finding, therefore, this route through the Mountains of Nepean to the still-water to be impracticable, we returned to the bottom of Likely Gully again, and crept on with the eighty-feet summit along the skirt of the mountainous ridge. After crossing in this route two small gullies which

may either be filled up or passed with two small aqueducts, we fell into the Rideau two miles from the swamp, being about five miles from the shores of Rafting Bay, in the Ottawa. At this place the banks of the river are thirty-eight feet high on the Nepean side, and eighty feet high on the other, sloping to the water's edge at an angle of thirty-one degrees. This place is on the east side of Peter's Gully, a large gully named after an axe-man, who very faithfully assisted me to explore it. At this place the summit-level is thirty feet above the level of the waters in the Rideau, which must be raised to it by a strong dam of that height; and as the bank is thirty-eight feet high, we shall have to cut through a distance of about two chains, to the depth of eight feet over and above the depth of the canal. This will be of little consequence, as this rock will have to be excavated, at any rate, to assist in constructing the dam.

The dam which we propose for this place is one of ninety feet base, having two-thirds of that base opposed, as it were, to the rapids, and the other third behind, that the slope may rise gently against the great pressure of the waters, and fall away steeper on the under side. A better idea of its proposed form will be obtained from the sec-

tions on the plan. It must curve gently over the top, to have heavy rubble-stone next the casing, and a body of clay, four feet thick, running vertically down the middle, so that it may be water-tight. The casing must be rectangular stones, six feet by three, and not less than a foot thick, packed vertically on the slopes, side by side, and breaking bond regularly throughout. At this place, the width of the Rideau is two hundred and forty-three feet; the banks and bottom are limestone rock. We would propose that the first courses of the sloping stones should be let three feet into the solid rock in the bottom of the river, so that the eddies may be prevented from working their way under the fabric.

“A strong dam, then, of the above dimensions, will not only lift the Rideau to the summit-level, but throw back from it a sheet of still water, according to the levels, for about half a mile, to a place called Willow Point, and into a channel on the Gloucester side of the river, opposite the point just mentioned, nearly a quarter of a mile farther. This channel is called the Gloucester *snie*, and seems by Nature made to receive the Rideau Canal; for it is not only a channel, or *snie*, winding through a low descending country, as it may be termed, all the way from the still-water, but on each side of it

there are pretty high banks, as the plan of the survey shows. The land-bank is twenty-four feet high, and the river-bank twenty-two feet on an average, and they are about four hundred and twenty-six feet apart in general. This great dam on the Rideau may also be found of utility as an engine for excavating the canal between it and Dow's Swamp; for, after the canal is formed, and the trees, earth, &c. loosened, if the flood-gate of the dam be opened, the waters of the Rideau will sweep these loose substances before it into the great swamp.

"This dam will back the water up Peter's Gully, in such a manner that the canal may enter it with less cutting than it would require to drive it through the bank on the brow of the river as stated, and will also form an entrance for it out of the way of the current; so that between this and the dam, there will be a corner reserved for the drift-wood of the Rideau.

"Farther up the river, 250 chains or thereabout, as near as could be measured owing to the thick trees, and about fifteen feet below the summit-level, is a noted ridge of rocks, called the Hog's Back, from the circumstance of raftsmen with their wares sticking on it in coming down the stream.

"Here the river is narrower than at Peter's

Gully, being two hundred and twenty feet wide ; and the banks on each side rise abruptly to the height of ninety feet. Did the banks not rise so high, we should have proposed at this place a dam of larger dimensions than the former one, of forty-five feet, so as to back the Rideau into the still-water at once, which is two miles and a half above it. By this arrangement the next three locks, or numbers nine, ten, and eleven, could have been placed together immediately behind it. This is by far the boldest plan, but by no means the safest. Its advantages, though seemingly great, will not, in our opinion, balance those of the other proposal. The length would be less, certainly : but then it would create more cutting through rocks, and embankments over gullies, as the section of the bank, taken from one dam to the other, will show. The question, however, is well worthy of consideration, and as such we submit it with much deference. I am very sure that both may be done, but the former we conceive to be an easier method than the latter, and not subject to such risk of being swept away by the great spring-floods of the Rideau, which we are told sometimes rise more than fourteen feet.

“Now that we are got into the Gloucester Snie, as before mentioned, our difficulties diminish greatly ;

for a dam of ten feet across the snie, from bank to bank, at the point where the backed-up waters from the Rideau-dam end, will throw the waters back another quarter of a mile up the snie. By placing a lock before this dam, we get into the second sheet of still-water in the snie; and where this ends again, another lock and dam bring us to the entrance of the still-water at Captain Wilson's.

“ At this place, for a few chains, we come up the line of Mr. Clowes, and both routes fall into the still-water at the same place. Mr. Clowes here proposes, as will be seen in his Report, to run a dam of seven feet across the Rideau, so as to deepen the still-water; and I perfectly agree with my brother surveyor, that a dam at this place to deepen the still-water is requisite, as it is full of little shoals, over which a canoe can with difficulty be passed. I should, however, think that a dam of seven feet is too high; as the banks on the Gloucester side of the river are here not more than six feet high, and therefore a dam of Mr. Clowes' dimensions would be apt to flood the beautiful fertile country on the banks of the river, which are cleared, and under the cultivation of very respectable settlers. We will, however, go the length of five feet with him, putting our last

lock directly behind its end on the Gloucester side of the river. By doing so, we shall have depth sufficient in the still-water, and if not better, we may deepen the shoals a foot or so, and then a free navigation is opened to the Black Rapids.

"From the rigours of a Canadian winter, and extreme roughness of the wilderness, I will not too confidently promise that all my measurements and levels are perfectly correct; but under all untoward circumstances I conceive that I have made an approximation to the truth. It now remains for me to return you a correct estimate of the works proposed to be constructed equally good with those of the Lachine Canal; and this shall be done to the best of my experience, knowledge, and calculation."

The estimate of this work, including all bridges, towing-paths, and minute things, came out to 87,500/.

Various other business engaged me until the middle of the following summer, treating with contractors, instructing people how to work, and commencing the excavations in the valley on the Ottawa; at length I received an order to proceed

and finish the survey of the Rideau Canal. Colonel By had examined all that had been done the previous winter, and was quite satisfied as to the correctness of the report. After labouring hard in the wilderness through the months of June and July, I got back to the Ottawa alive, and returned the following information.

" Ottawa, August 3, 1827.

" DEAR SIR,

" HAVING surveyed, examined, and explored with all my industry, attention, and ability, the nature, character, and connexions of that stupendous undertaking the Rideau Canal, I fail not to lay before you my ideas of the same, and to offer you whatever information I have gathered on this important subject. To do this in a systematic and brief manner, I divide the work into its natural sections, and treat of each as they occur in regular order. Last winter, I detailed to you the line of canal from its commencement at the Grand River Ottawa to the Black Rapids on the Rideau; and now it is thought proper to proceed where that report left off, and continue through to Kingston, the whole extent of the canal.

" Black Rapids.

"These rapids exist between Wilson's and Long Island still-waters, difference of level 8 feet 10 inches. The Rideau river at this place is 180 feet wide. To surmount these rapids, a dam of 220 feet in length, 12 feet in height above water-surface, with a lock of 10-ft. lift, and an embankment averaging 250 feet long and 5 feet high, will be necessary. The dam to run from bank to bank, at the foot of the rapids, where the bottom of the river is of a rocky nature, banks of clay, and of best quality for canal purposes. In a ravine good rock appears for building: this ravine and brook are on the west side of the river, where also a bight is found out of the water-way, suitable for building the lock in. The depth of water in this bight averages 4 feet, but will be deepened 1 foot 6 inches more, by the waters set back from the 45 feet dam at Hog's Back. Coffer-dam must inclose a water-surface of about five acres, so that the entrance to the lock may be safely cleared of all obstructions. Excavation for lock pit will average 8 feet in depth, and these excavations will be of use in forming the coffer-dam. No guard-lock will be required here, but a guard gate may be of service in the season of floods. The embankments to be made of clay, and to rise 2 feet above the

surface of dam or *caul*, that the waters may not run over them. This *caul*, or waste-weir, to be constructed after the usual manner, cored, cased, &c. with care, according to the proper slopes, and with duly curved parabolic at top, according to the laws of hydrostatics.

“ The banks of the river accord with the height of the dam. This dam will deepen the Long Island still-water to the required depth, and back two feet of water into the river-lock at the foot of Long Island, a distance of nearly five miles from the works at Black Rapids. On the whole, these works may be constructed at a very moderate rate, and are now in active operation.

“ *Long Island Rapids.*

“ Having come up the Long Island still-water, where the banks of the river are high, woody, and destitute of settlers, Long Island and the foot of the Rapids present themselves. This island is about four miles in length, and may contain two hundred and fifty acres; the rapids continue the whole length of the island, and from the still-water at head to that at bottom, the difference is nearly twenty-four feet. At this place an excellent situation discovers itself for the works which seem requisite to construct a link of the

Rideau Canal, which will afford an uninterrupted navigation of twenty-eight miles. This is on Mr. Hurlburt's farm, east bank of river.

" Here, as at Black Rapids, a bight is formed by the bank, out of the water-way, in which the locks can be most advantageously placed, to strike the river fair at both entrances when the dam is raised. There must be three locks at this place, of nine-feet lift each, so that a dam above surface-level be got over: this dam requires to be so raised above the level of the rapids, which is, as before stated, twenty-four feet, that the long sheet of still-water extending from the head of Long Island over Hurd's Shallows to the bottom of Burrett's Rapids, be deepened; as in many places of the above sheet, the natural water in the river, from bank to bank, will not average more in summer flood than two, and three feet in depth. The banks of the river along both sides of Long Island are perfectly sufficient for the retention of the waters raised by the above dam; as they have been faithfully explored, in consequence of there being doubts of their not being adequate for this purpose. A piece of rougher wilderness could with difficulty be found in Canada; a road opened through it, would greatly benefit the progress of the works.

" It is true that, immediately at the west end of the proposed dam, a valley is found stretching into the country, about two hundred yards in width, which, unless embanked to the height of eight feet, would allow the river to get round behind the dam, and so into its natural channel below. But the expense and trouble of forming this embankment are not comparable to the building another dam at White Horse Falls, (a place about two miles up the Rapids,) and building one of the proposed three locks there; which would have to be done, were the banks not found sufficient for the purposes of the dam. A guard-gate may be necessary here as at Black Rapids; but a guard-lock may be dispensed with. A paltry saw-mill, the property of Mr. Hurlburt, will be drowned by the dam, together with a few hundred acres of swamp wilderness, on the banks of the still-water, with about the one-third of Long Island. Let the locks be placed as they may, still the same average of swampy wilderness will be drowned; there is no possibility of avoiding this, as the river must be deepened. About one half of the proposed drowned part of Long Island might be saved; but this is of such small consideration

that it seems unnecessary to take it into account ; and as to seeking for remedies to preserve lands from being totally flooded, which are always so in the season of floods, and partially so every day in the year, it seems to me an unnecessary trouble unless Government is obliged to pay dear for acres of land not worth a farthing.

“ This dam at the foot of Long Island will be about 280 feet in length, and as it will throw the waters of the Rideau back on the thriving town of Richmond, by way of the valley already alluded to, the River Jocque may be dammed, and a connexion opened at a very moderate rate with the Rideau Canal, a plan which will greatly promote the prosperity of that town and of the surrounding country.

“ Thus, dams on a river are engines of the first importance ; not only because they overcome rapids and make rivers navigable, and thus save the great trouble of inland cutting, (which in Canada from the nature of its wildernesses, ought to be avoided,) but also because they make canals of all creeks, gullies, valleys, &c. within their influence—an object, surely, of much more consequence than the preservation of sickly and unfertile swamps.

" Burrets Rapids.

" Having got over Long Island Rapids, the fords in the still-water above, and Hurd's Shallows—which, after all the water proposed to be thrown back over them, may yet require farther deepening in some instances, by caisson-work, which is more proper than attempting to raise the dam another foot,—we come to Burrett's Rapids. There, instead of damming the river, or cutting through the rocky country, it is proposed to incline the canal into a natural *snie*, called the Oxford Snie, being in the township of that name on the east side of the river. This snie is about one mile and a half long, running parallel with the river; commencing, as is usual, with snies at the head of the rapids, and terminating at the still-water at the head of Hurd's Shallows. In this snie no excavation for the canal is required; it only requires to be cleared of trees and brushwood. At its lower end a lock of eleven feet two inches lift is proposed to be placed; and at its head, where the river is 240 feet wide, the water of the river is proposed to be carried into it by a dam 8 feet 6 inches above the surface of water-level. By this means Burrett's Rapids are overcome, which are 2 feet $7\frac{1}{2}$ inches; as well as Suter's Rapids, 1 foot $7\frac{1}{2}$ inches; and Doch-

erty's Ripple of 8 inches; while Cox's Still-Water is deepened, and also Cox's Rapid of 3 feet 6 inches, sending back 5 feet 6 inches in depth of water to the dam proposed at Nicholson's Rapid. Thus we avoid an intricate tract of country for canal purposes, where the banks of the river are ever varying alternately low on one side, and high on the other, where the fertile and old clear lands of the lower Rideau settlement interfere, and where the private interests of settlers are almost at open variance with one another.

" Nicholson's Rapids.

" At this place, where there is one of those natural bights of the river already commented on as suitable for building a lock in, we again set to work. This is on the east side of the river: I say on the east side, though, perhaps, more strictly it may be called south side; yet, as the Rideau River, taken upon the whole, runs north and south, for the sake of brief distinction I say always that one of its sides is east and the other west, although perhaps a bend or wimple may at times not accord with the rhomb of the compass. 200 feet will be about the length of Nicholson's Dam, and sixteen feet the height, requiring 300 feet of embanking on an average of eight feet in height.

The lock is of eleven-feet lift. It may be remarked that, in putting in this river-lock, no coffer-dams will be requisite, as at Long Island and Black Rapids; because at those places the river is deep; but here it is quite shallow, requiring all the water for the lock-chamber backed up from the snie-dam below.

“The lock may thus be built on a dry level bed of limestone; the excavation will average ten feet rock, and will answer for backing and wing-walls to the lock.

“*Rapids of Merrick's Mills.*”

“Nicholson's Rapids being levelled by the above dam, and surmounted by the above lock, we reach the limestone quarry of Mr. James Clowes, about three quarters of a mile above. Here a dam and lock, of nearly the same dimensions as the former, will be required, in order that deep water may be obtained over Merrick's Rapids, Shallows, Fords, &c. and six feet backed up to Merrick's Falls, so as to meet the river-lock proposed there that these falls may be overcome.

“The situation of this proposed dam and lock is extremely favourable, as a quarry of limestone fortunately occurs close to it: sixteen feet will be the height, and 200 feet the length, requiring

about eighty feet of embankment : when I say 200 feet in length, I mean that of water-way, and the embankment from water-edge to banks. The lock will be on the west side of the river, directly at the quarry, where the river is circumscribed in dimensions, and the banks are very favourable. In general, I have always found that the banks and rapids of the rivers of Canada correspond to one another in this particular ; that is to say, the height of the banks at the bottom of a rapid, is always about equal to the fall of that rapid, and only decreases as the rapid decreases, and *vice versa*. From this dam to Merrick's Falls, the distance is about two miles and a quarter.

" Merrick's Falls.

" At Merrick's Mills we have to contend with a fall of twenty-seven feet ten inches ; that is, from Macrea's still-water to the still-water below Merrick's Falls ; and this is proposed to be surmounted by the following method. Passing the east end of Merrick's Mill-dam, which is 368 feet in length, twenty-nine feet wide, and which raises the water twelve feet, there is a *snie*, which has been converted into a rafting-channel. In this *snie*, or rafting channel, we propose to place three

locks, each of eight feet four inches lift. The channel is shelving limestone, and tolerably favourable for such buildings. No coffer-dam for river-lock will be required, as six feet is thrown back from the dam, at the foot of Merrick's Rapids, which is sufficient for the chamber of river-lock. Where the rafting-channel terminates in Merrick's Mill-pond, the distance is 1250 feet to the waters below. The channel runs straight; and when it leaves the Mill-pond, a distance of two hundred and ten feet, a wooden truss-bridge, sixteen feet wide, well-constructed, passes over it. The width of the channel at the bridge is forty-six feet. Twenty-four feet four inches is the elevation of Mill-pond above the still-water below, leaving a fall of three feet six inches from Macrea's to the Mill-pond. In the middle of this fall, directly above Mill-pond, where the river is narrow and shallow, a six-feet dam in height is proposed: one hundred and fifty feet is the width of the river at this place, the bottom of which is hard limestone. The object of this dam, which is two hundred yards from the bridge, is to lift the river into a snie on the east side, which snie terminates in the mouth of the rafting-channel, where are the proposed locks. Now this

snie, by a little deepening and stone embanking, can be connected with the entrance of the locks, which not only brings the Canal above Merrick's Mills, but over the Rapids above them, and into Macrea's still-water. This is seven miles in length, being all the way to Maitland's Rapids, and there raises the river one foot six inches; there will, nevertheless, for about five hundred yards at Macrea's, be one foot of rock excavation required, which will be a troublesome thing to execute; but, as the banks of the river alongside will bear nothing more, an obstacle that cannot be avoided must be encountered. There is a possibility of passing Merrick's Mills with the Canal at the west end of the dry stone dam; but some rock excavation, averaging twelve feet in depth, for two hundred and fifty yards, would have to be encountered; and moreover, by taking the Canal this way, it would be injurious to a grist-mill, forty feet by thirty, and a saw-mill, thirty-four by twenty-four, which are almost in the line on this side the river. On the whole, the masonry and building in the works at Merrick's Mills will be considerable. The locks, wing-walls, stone embankments, dam, &c. will form altogether a large piece of work; yet the materials of all kinds being on the spot, make the business comparatively easy.

" Maitland's Rapids.

" Between these Rapids and Macrea's, the river is deep, but filled with grassy sedgy islands, which must be cleared out of the way. Indeed, in other parts of the river, before coming to this section, there are various floating marshes met with, which must be shoved out, and the banks and bottom freed from rotten trees, and other dissolving vegetable matter. A dam of three feet is required here to cross the river at the Ferry, opposite Maitland's house; one hundred and eighty-six feet is the width of the river at this place, and ninety feet the distance to the west bank. The use of this dam is to deepen Edmund's Shallows, three and a half miles above, and to lull a small rapid between. A snie exists at this place, by which we pass the rapid with trifling cutting. In this snie a lock of four-feet lift is proposed: this lock is 700 feet distant from the river above, and 791 feet from the river below, to be placed at a bend in the snie. For the 700 feet, four feet of excavation is required; but for the other distance, merely scouring out will answer, with a little deepening towards the mouth of the lock. Small deepenings of this nature will be required at other locks already noticed, but these are of such a trifling nature that they scarcely deserve a remark.

"A little way above this snie, there is another, which probably may require a small embankment thrown across it, as in floods the waters above the rapids find vent that way. Above the rapids, likewise, is a considerable creek, striking out into the country, called Vandozer's Creek: where it comes from is unknown,—my time would not afford me leisure to explore it. Beneath the rapid, comes out Irish Creek, from Irish Lake, to be afterwards examined.

"Edmund's Rapids.

"These are met with between the head of Maitland's still-water, already mentioned, and Phillips' Bay, consisting of a chain of small ripples, not worthy the name of rapids, for about three miles in length; yet, small as they are, their aggregate amount is considerable (being 12 feet); and as the banks are extremely low, two dams and two locks are required. The first dam to be placed nearly opposite Mr. James Edmund's house, to raise the water eight feet perpendicular; but as two feet are proposed to be thrown back from Maitland's Dam, a lock of six-feet lift will get over it. This lock to be built on the east side of the river, and in the middle of Edmund's Shallows, 450 feet down the bank from the end of the dam. The dam has 123

feet water-way from Edmund's shore to an island, whose width is 200 feet, and the snie beyond 100 feet. The island will require an embankment, averaging four feet, and the embankments on either shore to come to the top of them : 68 feet on Edmund's, or west shore, and 98 on east shore,

" The reason of dropping down the east bank so far with the proposed lock, is to pass a small rapid, and part of Edmund's Shallows, the remainder of the Shallows being expected to be deepened enough by the two feet thrown back from Maitland's Dam. The excavation for the Canal along this bank will average eight feet, and probably some rock will appear as an interruption.—I may here remark, that laying out canals in Canada is a business perfectly different from that in Britain ; for there the order of engineers is to fly the rivers, but here it is quite the reverse. The rivers are shunned, because the freshets in that country are sudden, and in a few hours bring destruction on works of art placed in them ; by leaving rivers, also, inland marts are benefited ;—whereas, in this country, no inland towns are known ; and the seasons, though running on extremes, are not sudden in their degrees—neither with heat nor cold, dryness nor moisture.

" The second, or upper dam of Edmund's Rapids

is proposed to be placed within one quarter of a mile of Philips' Bay, about four miles above the former, at a spot where the river is narrow and banks are favourable. Water-way at this place is 160 feet, and there are 150 feet of five feet embanking; height of dam eleven feet: the lock to be placed on the east side of the river, where there is a convenient place: lift of lock 5 feet 1 inch and a quarter; excavation for lock and entrance 6 feet deep, partly rock. This dam will drown a little rapid above of 2 feet 1 inch and a quarter, and throw up 4 feet to Sly's Dam, at the foot of the rapids of Smith's Falls, a distance of two miles. It will also raise the river into a snie on the east side of the river, beside Philips' Bay, by which means an ugly bend in the river will be avoided.

" Rapids of Smith's Falls.

" At an old settler's house of the name of Sly, a dam is proposed, called Sly's Dam, to do the business of these rapids, and form a free navigation to the foot of Smith's Falls, four miles above. Dam 19 feet in height, width of river 150 feet, and length of embankment 250 feet, averaging six feet high. The banks are extremely favourable for retention on both sides, and there is plenty of white free-stone rock. Two locks are proposed to

be placed here on the west side of the river, where a favourable bight is discovered; one lock will require to be 8 feet lift, and another 7. By this dam no land of any consequence will be drowned or molested, but the lower part of old Sly's house will be inundated, and a new one will be required for him at 50*l.* value. At this place the cubic feet of water passing down the Rideau per hour are 345,000; a sufficient supply for ten locks of ten-feet lift every hour; but when the large lakes and reservoirs are filled, they will be able to supply more than a thousand locks per hour, without being sensibly diminished in level. In estimating the quantity of waters in the Rideau, we find them, when they leave the Rideau Lake at Oliver's Ferry, to be double what they are at Burrett's, thirty miles down the river: the cause of this seems not to be accounted for, by supposing that there are subterranean ducts which swallow a portion of the waters; but may rather be explained by evaporation, since for the above distance the river flows rapidly in thin sheets over horizontal beds of warm limestone rock.

"Smith's Falls.

"To the minds of people accustomed to canalling business, these Falls become as appalling an object

as any that is to be met with : they fall over beds of hard bastard marble rock, 36 feet in less than one quarter of a mile. At this place there are numbers of islands formed by snies winding round the Falls. Between one of these and the west bank of the river, we propose a dam of 23 feet ; this dam is directly in the middle of the rapid, and nearly opposite to Rykert's Store : 96 feet at bottom, 200 at top, will be the length of the dam. This dam is proposed to check the water oozing through the fissures at the above rocky island, and to throw the water over the Falls, so that the still-water above may be deepened 2 feet 7 inches, and also that the snie immediately behind the island may be filled with water ; for in this place we propose three locks of 11 feet 2 inches lift each, the dam forming the waste-weir to the same.

“ The width of the Rocky Island, from dam to snie, is 290 feet, and of height sufficient for the dam. The snie has low banks for 420 feet on its east side, which will require a stone embankment, so as to get above the rapid from wing-wall of upper lock, and save Ward's Farm from inundation. At the bottom of the snie, about 50 feet from the Rideau, the locks begin to be put in. At the bottom, the rock is of a shelving nature, doing away with the necessity of having inverted

arches; indeed, few inverted arches seem to be necessary throughout the whole work. The first lock-pit will have to be excavated seven, the second two feet; the bottom of the third is five feet above level. Considerable backing-in and retaining wing-wall work are required about the Hörnet's Snie—we denominate it so, from the trouble these insects gave us; while patiently measuring and surveying it we were severely stung, yet this snie could not be lost sight of: its average width is 60 feet, its banks, at lower end, are 20 feet, and width 86 feet. The banks of the Rideau, opposite the mouth of the snie, are 86 feet, and the mouth is 220 feet, beneath a saw-mill. This mill is 150 feet beneath the end of the proposed dam, being nearly between Saw-mill Dam and the saw-mill. We are thus particular, as the dam to be built nearer the mill would destroy it, and if farther up the stream, the water would get out of the snie behind it. By the above means, therefore, we surmount the Falls without being obliged to cut three miles round them, through a rocky country averaging ten feet deep to canal bottom, with rock that defies the strength of gunpowder or crow-bars to remove it, and would weary the British treasury with expenses.

“Behind Smith's Falls, about three miles on the

west side of the river, there is a large swampy tract of country, a chain of extensive beaver meadows winding-in, and terminating somewhere nigh to Merrick's Mills, fifteen miles below. These swamps, from the river levels, must form something like an inclined plane, having an elevation of nearly 100 feet. Now, to cut through these swamps for fifteen miles, and miss six miles of natural river navigation, and to construct ten locks in a swamp, and all apart from each other, the whole, too, remote from reservoirs which such works require, seems to me a preposterous idea. Yet it is advanced, and I must own it preferable to the one almost adopted, of cutting through the above mentioned long ledges of Plutonic rock.

"First Rapids of the Rideau.

"No sooner have we struggled over our difficulties at Smith's Falls, than we encounter others almost equally irksome, but different in their nature. These are a chain of small rapids, where the river banks are low and swampy, where the bed of the river is the above-mentioned rock, and where, in short, we neither can dam, deepen, nor yet cut through the country. At the head of the chain of rapids, it is true, the banks of the river can bear a dam of four feet; but what avails that when it is

above the rapids? nevertheless, a dam of four feet in height is proposed there. This place is about eight miles from Oliver's Ferry, and about three from Smith's Falls. The Rideau here is 260 feet wide, running shallow over a smooth bed of limestone, to the depth of six inches. This dam will deepen the shallows at the mouth of the Perth River, as it falls into the Rideau; also those of the Upper Narrows, Rideau Lake. It will also deepen the Tay, or Perth river; and throw 3 feet 6 inches of water upon the Fishing Falls there. Past its east end a quantity of water will flow, which can be diverted down the swampy bank, to the still-water below the rapids, a distance of about a mile. This swamp has $3\frac{1}{2}$ feet of black mud, resting on a smooth bed of the above limestone. We propose to widen the cutting of the Canal through this swamp, and scrape the black mud from the rock, forming with it the necessary embankments. At the bottom of the rapids stands the lock of seven-feet lift to bring the Canal into the still-water. Notwithstanding all our precaution in avoiding this rock, I am afraid that at times we may be obliged to undertake the excavation of a foot or two of it, which would be a serious matter, if it even continued 60 yards. By the above dam, and the one at Smith's Falls, some of the swampy wilderness

must be transformed into lakes. Altogether, the land required for the Rideau Canal, by keeping the river, is small ; for if the average of the surface of the river be taken into account, and the same for forty feet from either brink up the banks, which is Government property, there remains not half the quantity of land to be purchased from individuals, as there would have been if the Canal had taken an expensive inland route, and forsaken the river. Moreover, the dams proposed to be placed in the Rideau will drown but very little more land than the river at present drowns when in flood. The extensive swamps along many places of its banks, are the property of no private individuals, from which cause Government may treat them as is thought proper. An acre of water is generally more valuable than an acre of land. This is a truth nowhere better known than in England.

“ River Tay, or Perth River.

“ Having now climbed up by a great succession of dams and locks to the noble summit pond of the Rideau Lake, I digress a little, and give an account of a survey made of the Perth River. About five miles from Oliver’s Ferry, the mouth of the Tay opens into the Rideau : for two miles

up, it may be easily made navigable, requiring only a little mud scraping, and rushy matters taken out of the way. After this distance we come to the Fishing Falls, so named by the inhabitants from the fishing-nets placed there. These rapids are about a mile and a half in length, with limestone horizontal rock, but shelving, and fall about 19 feet throughout the rapids. The banks of the river are generally low. At one place, however, about 200 yards below, where the waters make a sudden fall of 4 feet at once, a dam of 12 feet and lock may be obtained; the dam 140 feet long, sufficient to lull the rapids above. The remainder of the rapids below can only be overcome either by deepening the channel, or quitting the river, and digging about half a mile through loamy wilderness. These rapids or Fishing Falls surmounted, we come to M'Vittie's still-water, of three feet in depth, for two miles, and passing it to the Upper Rapids, there are only 550 yards in length, with a fall of four feet to overcome, when the river must be left again, and the country cut through for the above distance, putting in the lock where it falls into the still-waters below. We next gained the Perth still-water, a sheet of about five miles long, average depth three feet, banks swampy, and river choked with sedge-grass, bul-

rush, and wild rice, which being cleared away, a navigation of three feet in depth is open to Perth; to go one foot deeper would require much money and labour.

“Between the Fishing Falls and Upper Rapids, a creek runs out on the south side of the river, called Jebb’s Creek, after the intelligent man of that name who first explored it. This creek flows from Otty Lake, which is about a mile from Rideau Lake; perhaps a route might be found up this creek. There are also good accounts of a swamp snie which leaves M’Vittie’s still-water, and falls into the Rideau Lake. All these snies and creeks I would have searched, had there not been much more important service on my hands; but I regret they are not thoroughly examined. Had the Tay, like the Jocque, fallen into the Rideau, beneath some of the Rideau Falls, the dams and locks on these rapids of the Rideau would have opened up the Perth navigation; whereas it is only aided two feet, which are thrown into it by the last dam, as already mentioned. The land around Perth is tolerably fertile, but the situation of the town is unhealthy, from its surrounding swamps. It is about 30 feet above the level of Rideau Lake, and nearly 400 feet above the city of Montreal; it is almost on a level with the Mis-

issippi Lake, and it seems to me, that if the navigation of Cockburn Creek, which fall into the Rideau at First Rapids, was opened to the above mentioned lake, (an object, by all reports of an easy nature to perform,) then a navigation through Perth Settlement, by way of creek and lake, might become an advantageous concern.

" Oliver's Ferry.

"This will become an important station on the Rideau Canal, as the public road between Perth and Brockville passes by here; from Perth, 8 miles, from Brockville, 35 miles. Rideau Lake at this place, is 464 feet wide and 35 deep, and rises in spring $3\frac{1}{4}$ feet; foot-passengers here pay three pence a piece for ferryage, and waggons fifteen pence. A wooden truss bridge might be raised over the Ferry for 1500*l*. This Ferry runs across what is termed the Lower Narrows, Rideau Lake.

" Upper Narrows, Rideau Lake.

"Here the lake contracts to about 100 feet in width, and becomes very shallow: $4\frac{1}{2}$ feet deepening will be required through free-stone rock and gravel; two coffer-dams will be required here; south coffer-dam must be 180 feet wide, and the north 150. I thought it might be more proper

to cut through the low head-land ; but the water on the north side keeping shallow, prevented the attempt. The length of deepening will be about 250 feet. This is a fine situation for a small village. The shores of the Rideau Lake are rocky and bold, yet they abound in unexplored bays, which should be examined.

“ Isthmus of Rideau Lake.

“ Between Mud Lake and Rideau Lake, there is an isthmus of one mile and a quarter ; a swamp runs from the north landing-place : half-way across, where it terminates, it is about 30 feet above level. This swamp, which is an inclined plane, will have an average cutting of 12 feet. A small ridge, 130 yards wide, requires 25 feet cutting ; the line then falls into a beaver meadow, where there will be 14 feet cutting, and thence into Mud Lake. This lake being below the level of Rideau Lake $3\frac{1}{4}$ feet, has, of consequence, to be raised by the dam at Chaffey's Mills. Throughout this line of proposed cutting, little rock is expected to be met with, except about the ridge ; but had the line been run straight, as laid out between the lakes, a hill of rock would have to be cut through 44 feet above level for 300 yards. For this work two small coffer-dams are required to deepen the Canal into

either lake ; but the coffer-dam on the north side will require to be $6\frac{1}{2}$ feet, and that on the south side 4 feet. The excavations through this cut will probably be full of mineral substances ; at least, if we may judge from surface appearance.

“ Isthmus of Clear Lake.

“ This isthmus is 143 feet wide ; cutting about 4 feet, and two small coffer-dams, of 4 feet deep each. As $3\frac{1}{2}$ feet is backed from the dam at Chaffey’s Mills, Clear Lake and Indian Lake are on a level. Deepening and clearing out will be required between Mud Lake and Clear Lake, 2 feet for 300 yards, and the banks to be dressed.

“ Chaffey’s Rapids.

“ Having passed Rideau Lake, Mud, Clear, and Indian Lakes, we come to Chaffey’s Mills, a very extensive establishment, consisting of saw, grist, and fulling-mills, carding-machines, stores, barns, distillery, &c. filling up the whole river, and not to be estimated at a less expense than 50000/. On first examining this place, I thought to have found no difficulty in passing the mills with the Canal, as a valley on the east side of the river seemed to set the matter at rest. But, in exploring this valley, nothing was found but deep rocky excavation, and

it appeared that, after all, it would lead the Canal through woods and swamps two miles about—these were sufficient causes for a relinquishment of that route. The river was most carefully examined on its western side, with even worse success. A place was discovered below the mills, where a dam could easily be put, and two locks, sufficient for overcoming the whole rapids, of 13 feet, deepening the river above, raising the level of the lakes, &c.; but by this course the great mill establishment became drowned. Under these circumstances, I am not ashamed to own that I was more puzzled to know how to act, than on any other part of the route. High banks on either side of a river, and mills choking up that river, seemed to defy the science of engineering to pass them with the Canal, unless by running matters to a great expense. But, after taking the following measurements, levels, &c. and pondering on the subject, I came at last to a conclusion. Nine and a quarter feet was found to be the fall of Chaffey's Mill-dam, and the remainder of Rapid 3 feet 9½ inches, beneath the mill-dam—where this Rapid began below it, was 1136 feet from the mill-bridge; length of the bridge 91 feet. On going to the bottom of the rapids, it was found that a break took place in the rocky bank, in which a

lock might be advantageously built; and this lock might be 6-feet lift, without injuring the mills in any respect, farther than obliging the millers to lift their small horizontal wheels about 14 inches—a thing of no great trouble. By placing a lock here, it was found that the mills might be passed, by a trifling cutting of 10 feet. The dam for this lock requires to be 60 feet wide. Beneath the lock, the river will have to be deepened 2 feet for 150 feet; the bottom is rocky. Where the Canal takes the river again, above the mills, a lock of 11 feet 2 inches is required, and a dam 65 feet long across the river, so as to raise it 5 feet, on a level with the Rideau Lake, and to deepen the fords between. The stone abounding at Chaffey's Mills is of a singular nature, resembling white granite, but it is a species of limestone.

“ Davis's Rapids.

“ After leaving Chaffey's Mills, we sail through Davis's Lake to Davis's Rapids and Mills, where we easily carry the Canal past the Mills on west side of river; 7 feet 3½ inches, the fall of rapid, requiring a 9-feet lock. The cutting here will be 363 feet: no dam is necessary, as a snie, 30 feet wide, is taken advantage of; but probably Davis's Mill-dam, which is 270 feet in length, will have to

be constructed anew, as it is the engine which at present backs up the water. A little bar above the Mills requires deepening; the excavations are supposed to be gravel.

" Jones's Falls.

"These are the greatest in the least distance that are met with in the whole route, rolling down a narrow ravine scarcely a mile in length, and having a 60-feet fall. The banks of this narrow and crooked ravine are lofty, averaging 90 feet in height; and on their west side there are deep bogs, surrounded by high land. The methods which have been proposed to pass these falls with the Rideau Canal are various: one is to build the locks, of 10-feet lift each, in the bottom of the ravine; but this plan is objectionable on the score that they will be placed in the way of freshets and floods, and suffer from that cause. It is also an objection that as the ravine is crooked, and cannot be straightened, from the nature of its steep free-stone banks, the locks cannot be placed in such a manner as not to have their entrances awkwardly set for boats to get in and out of them. Again, if placed in the ravine, the rock excavation will be great, and the builders troubled with waters; as it yet remains a problem, whether a dam at the

head of the falls can hinder the water from flowing in from the lake. Secondly, two dams, of 30 feet each, are proposed to be raised at the two narrow guts of the ravine, where it is 50 feet in width, and to place three locks behind each; but this method is subject to some of the evils of the former, such as to floods, and to finding a proper situation for the locks, &c. Thirdly, it is proposed to raise a dam of 20 feet beneath the first rapid, and throw the Canal into a valley on the east side of the river; but here would be much cutting, and the Canal would be taken nearly two miles round. Fourthly, it is proposed to build a dam at the lower gut, 762 feet from the still-water below, and 14 feet up the rapids; this dam to be 48 feet in height. The whole rapids in the wild ravine would thus be drowned, and the lake above raised to 2 feet, which would give depth of water at Davis's Mill. But the erection of this dam would also throw the waters down Macdonald's gully, the mouth of which opens beside it on the west side. The highest part of the bottom of the gully would be covered with 33 feet 6 inches depth of water. The dimensions of this strange gully are as follow: 677 yards in length, 1009 feet from its upper mouth to summit height, and from thence 1012 to the still-water below.

Never was there a better place than this gully to build the locks. A combination of three locks at two places is therefore proposed, having a basin between, 304 feet long, and 130 feet wide. The banks on each side of this gully average 50 feet, and seem to contain beautiful quarries of free-stone for the locks. At the summit-level of the gully, its width is 130 feet—a space of sufficient dimensions for all the purposes of the Canal. The dam will require, from the nature of the banks, to be 216 feet long at the top, but the average length will not be above 100 feet. It is almost made already, from lumps of rock standing 20 feet from its base; the whole requires filling in from the high rocky banks above, and to be cased, as with other cauls. The construction of this dam, which is 3 feet higher than that at Hog's Back, will, after all, be a trifle when compared to the latter. The superiority of this plan to the others seems to me so obvious, that even proofs are unnecessary. By it the works come to a focus. The locks and dam are beside one another, surrounded by quarries: the dam in a gut of the river which no floods can shake; the locks lie in fair entrance lines, without requiring any thing like heavy cutting. The whole of the trouble

of building in water, or in being troubled with water when built, is thus avoided.

“ Cranberry Marsh.

“ This requires a little deepening with the marsh-drag, as in the fens of England. The dam at Brewer's Upper Mill will drown them 2 feet 6 inches; so the labours here are trivial, scarcely deserving to be estimated. The dam at White Fish Falls, on the River Gananoque, and that at Round Tail, on the River Cataroque, must both be removed, and some dead timber taken out of Cranberry Lake, which has been drowned by the raising of these dams. Cranberry Marsh is about nine miles in length, and its lake about the same.

“ Round Tail.

“ This is rather a remarkable spot on the line, being a break in a ledge of rocks that the Cataroque, or Kingston River, may burst from its source, the lake—45 feet is its width. In it is placed a dam which must be removed: lift of dam being 4 feet 8 inches, and depth below dam-cill 7 feet. The dam proposed at Brewer's Upper Mill will do away with this dam, and throw 2 feet 6 inches over the drowned woods more than at present.

" Brewer's Upper Mill.

" About a mile beneath the Round Tail is this place, an extensive mill establishment, built on a rapid, whose declivity is 10 feet 9 inches. On the west side of the river indulgent Nature has given us a valley to take the Canal past the Mills to the still-water below, a distance of about 500 yards; 1490 feet from water above to the summit of valley, and 1250 from thence to water below: 25 feet is the highest land met with in the valley above the level of the waters below;—width of the valley averages 120, and banks 20 feet. The proposed dam, 180 feet above the Mill, will require to be 50 feet long, with a side retaining-wall of 80 feet, from an island of 10 feet in height to the main land: between said island and main shore, a distance of 50 feet, the canal leaves the river. Two locks, of 9 feet-lift each, are required to be placed on the south exposure of the valley; 12 feet will be the average depth of clay excavation of the locks, and 6 feet the average cutting from the river below to the locks, which is 800 feet. The dam will require to lift the water above surface of Mill-pond about 9 feet. This Mill is 43 by 61½ feet, and is altogether so respectable,

that it is needless to drown it, when it is not in the way of the Canal, as has been proposed.

" Brewer's Lower Mill.

" This is about three miles and a half farther down the stream than the former, 11 feet being the fall of the Mill-dam, and a small rapid between the Mills of 2 feet 6 $\frac{3}{4}$ inches. Of course, the whole fall to be overcome is 13 feet 6 $\frac{3}{4}$ inches ; but as 4 feet is proposed to be backed up on this Mill from the dam at Billydore's Rifts, and only one foot from the Lower Mill to the Upper, a lock of 10 feet 7 inches will answer : 822 feet will be the length of cutting round the Mill, averaging 10 feet cutting loamy clay. Here the River Cataroque is 80 feet in width, having deep loamy clay banks ; 140 feet is the length of the Mill-dam, and the Mill 24 by 60. Some flinty whitstone abounds in the bed of the river, but it is difficult to say if it be of a quality to build the locks with.

" Billydore's Rifts.

" These rifts, as they are called, otherwise small ripples, continue about a mile. Their fall is about four feet ; but from the rough state of this country, we found it impracticable to take the levels accurately until it be cleared. The banks

to Brewer's Lower Mill admit of a dam sufficient for the rapid and lift of lock, which will require to be $6\frac{1}{2}$ feet. The bottom of the river is rocky, the banks are loamy clay. Sometimes temporary dams are made here by raftsmen, that they may bring down their timber to market. The River Cataroque is about a quarter part less than the Rideau at Merrick's Mills.

" Jack's Rifts.

" These are about seven miles beneath the former Rifts, and will require a dam and lock of nearly similar dimensions. But this country being then clearing of trees and brushwood, it was impossible to take the levels over it; however, it was easily seen that the river, with small trouble, might be made perfectly navigable, as it wound gently along, 4 feet deep, 80 feet wide, between clay banks, averaging 8 feet in height.

" Kingston Mills, and Mill Creek.

" Six miles beneath Jack's Rifts, we come to Kingston Mills, situated on a fall of 26 feet; and with little trouble, excepting cutting through a lump of granite rock 120 feet long, and averaging 20 feet in depth. We can lock ourselves

down by three locks of 9 feet 4 inches lift each, into Kingston Mill Creek, as two feet will have to be backed over the pond shallows to Jack's Rifts, by a dam at Mill-bridge 183 feet long. The depth of the water at the bridge is 8 feet 6 inches, so the height of the dam from the bottom will be 10 feet 6 inches. Opposite the mouth of the proposed locks, the Mill-creek (which is the Cataroque) is 130 feet wide, banks rocky, and rising to the height of 100 feet; where the locks fall into the creek, it is 596 feet below the Mill-dam. At a natural rend in the rock, the excavation of river-lock and second lock will be rock to their depths; but the third will not require any: from the head of the locks to the Mill-pond, as the distance is 220 yards, and ground uneven, 8 feet will be about this average cutting. Getting into this creek, we have plenty of deep water all the way to Kingston Bay, where the Canal terminates, excepting at a small ford opposite Ganeox's Farm, where there was only $4\frac{1}{2}$ feet for about 100 feet. This may be deepened, say 3 feet, and that is allowing 2 feet for the fluctuations of Lake Ontario. Ought not this, surely, to be adopted, before cutting two miles through marshes, and two miles more through swamps, as proposed and laid out?

" Having now brought the Canal into that beautiful bay of Lake Ontario, Kingston Bay, my labours come to a close.

" To my assistants, one and all, my warmest wishes for their welfare are due. If ever men struggled to do their duty, we did ; and if that duty be wrongly conceived, I submit with the utmost deference to persons of superior judgment, who I sincerely hope will correct what may be found erroneous.

" I am, &c."

The estimate of all this work, carefully made out, was 398,560*l.* which, with the former 87,500*l.* brought the expenses of the Rideau Canal to 486,060*l.*

When the woods came to be cleared away, and roads opened, an examination of the survey was entered into, when it was found to be nearly correct ; and, although the dimensions of locks have been altered and made larger, to pass steam-vessels, still this does not affect the survey, although it will alter the estimate.

The locks were first laid out of the size of those of Lachine, 100 feet long, 20 feet wide, but afterwards 142 feet by 33 ; in both cases the depth of

water was the same, 5 feet : the number of locks in all amounted to 47.

In the winter, previous to the survey from Black Rapids to Kingston, I drew out the following plan for managing this large work, which was allowed to be made public in the newspapers.

“ System proposed for conducting the Works of the Rideau Canal, in Upper Canada.

“ As the Rideau Canal is evidently an undertaking of great enterprise, it therefore requires that a proper system should be adopted as soon as possible, and that the execution of the same be carried into effect in the best and most economical manner possible.

“ The British Government has determined upon executing this undertaking, and now looks to those who have been considered qualified for that purpose, for such plans, and for that matured system, which will, in all probability, accomplish the great work in question.

“ For this purpose, let it be stated in the outset, that all views of the subject shall be extensive, nothing of a contracted nature shall enter into competition ; it is false economy, not to take the Rideau Canal on a broad scale. No squandering,

nor vain and foolish speculation can be, of course, allowed; but yet, what long practice and experience warrant, must be attended to and acted on, in defiance of those who consider a shilling thrown away, when they have not the penetration and sagacity to discover that it was spent for other purposes, and for what they know nothing about. The British Government has concluded that the extensive works of the Rideau Canal shall be executed by contract; and this conclusion is certainly the result of wise investigation into works of a similar nature; for, of a surety, there is no method hitherto discovered which can equal in every respect that of letting out the works to be executed to contractors, who have proved themselves, by works they have previously performed, to be fully competent for the tasks they take on hand. And, in giving out contracts, it is best to allow no contractor to have any thing to do with them, be his cash or consequence what they may, unless he is well known as a practical artist, competent for what he professes; for when Government advances nothing more, or not so much money on contracts, as the contractor has laid out, of course there is little for any surety work in the matter: so that, when Government finds a contractor qualified for the execution of his contract, if that person has but

little money or means, he may, nevertheless, turn out an excellent contractor. For, as the Government will keep an extensive store at the works of every article requisite for their expeditious prosecution, contractors can be supplied therefrom, if unable to supply themselves elsewhere; and it would be useless for them to seek elsewhere, as Government can supply them cheaper and better than they will find any where else in Canada.

“No contractor shall be allowed to contract for any work out of his line and profession. Thus, to a mason shall not be given a job of excavation, any more than to an excavator a piece of building or mason-work.

“The works of the Rideau Canal seem to divide themselves into the following great branches: building and finishing locks of heavy masonry, excavating earth and clay, excavating rock and gravel, constructing heavy dams across the Rideau of rough rubble masonry, framing aqueducts and bridges of wood, &c.

“Now any one of these branches is quite enough for any contractor to perform properly, and will absorb his utmost attention; and all contractors who prove, or have proved themselves capable to conduct the work they take in hand, ought to have as much of their own particular branch given them

as they have possible power to perform : this is no more than doing justice to worthy men, and at the same time (whatever may be argued to the contrary) doing justice to the British Government. Here are liberality and economy working for one another's mutual interests.

“ Every care shall be taken with respect to the comfort of the contractors and their people : they will have places near the works (wherever these may be) whereon temporary buildings may be erected; and the utmost assistance will be afforded by the Government to the erection of such buildings, so that every person will be safely sheltered, and no time lost in coming and going to the works. There shall be a subaltern's command of sixty soldiers always stationed near, that peace and quietness may be preserved ; as in a wilderness, like that through which the Rideau Canal has to pass, there is no protection to be had from the civil power. Surgeons shall be engaged, and furnished with medicines, for the benefit of the sick ; as the swampy wilderness, and swampy waters, may sometimes create distempers. Plenty of spirits, and provisions of all sorts, with beds, blankets, mits, caps, shoes, &c. shall be always at hand, in the Government store, to answer whatever demands may come for such articles by the people on

the work, so that every one may be kept strong, healthy, and cheerful. There is a melancholy peculiar to Canada, which must be combated. People who labour under it must be encouraged with soothing language, good treatment, and now and then, as circumstances require, a little assistance, gratis, as a stimulant.

"It shall always be ascertained if contractors pay their workmen's wages, and a certain sum of money shall be kept out of the contractor's hands to meet this special purpose.

"The whole of the works on the line of the Rideau Canal shall be commenced, if possible, nearly at the same time; the period allowed to complete the undertaking being short for a work of such magnitude, in such a situation, and under such a climate, where people cannot work to any great advantage more than one-half of the year. All contractors ought to be bound to remain in person on the works they engage to execute; for unless they do so, the works, in all probability, will suffer by their absence, and they themselves be much injured by such inattention.

"By such a system, it is expected, with all dependence on the kindness of Providence, that the Rideau Canal may be constructed."

When I drew up this system, there was one circumstance mentioned which I greatly regretted to find expunged, as it gave us much trouble. This was the clause that 'no sub-contractors would be allowed on any account whatever.' Vagabonds were hired to perform jobs by contractors; and these thought the Government entitled to look after them,—just as if they would have any thing to do with those they did not know. Sub-contractors are the worst animals that can ever come upon a public work. However, the system did good; the sharks of storekeepers were held at bay, and poor labourers were not devoured.

The Rideau Canal, when constructed, will be perfectly different from any other in the known world, since it is not ditched or cut out by the hand of man. Natural rivers and lakes are made use of for this Canal, and all that science or art has to do in the matter, is in the lockage of the rapids or waterfalls, which exist either between extensive sheets of still river water, or expansive lakes. To surmount this difficulty, dams are proposed, and, in many instances, already raised, at the bottom of the rapids, or sometimes at their head, or even, as the case may be, in their middle, by which means the rapids and waterfalls are converted into still-water. These dams are of various

heights, according to the lift of the rapid they have to overcome ; they cross the rivers where the banks are found to be most retentive and the space narrow ; and immediately behind them, or in some instances, as the nature of the country requires, at one end, the locks are excavated out and built. These locks vary in lift according to the lift of rapid : where the rapid is 60 feet, the locks are proposed to be six in number ; if 80 feet, eight, and so forth : 10 feet being always considered a proper lift for a lock. The extensive utility of these dams must be obvious to any person who considers the business in an engineering point of view ; they do away with lines of extended excavations through a thick-wooded wilderness. In several instances, a dam not more than 24 feet high, and 180 feet wide, will throw the rapids and rivers into a still sheet above it for a distance of more than 20 miles. The dams also back the waters up creeks, ravines, and valleys ; and, instead of making one canal, they form numerous canals of various ramifications, which will all tend greatly to the improvement of a very fertile country. As they convert the rivers into extensive reservoirs, they may be filled and emptied as often as possible, without creating either the slightest disturbance in the movements of the

waters of the lakes, or sensible diminution of their contents. But, when a canal is ditched through a country, if the locks have occasion to be often opened and shut, a current is raised in the canal, and the waters are not unfrequently drained out of it, or, at least, are reduced beneath the proper navigable depth. Does it not, then, appear in the clearest manner possible, that the Rideau Canal can never be in want of water, unless a convulsion take place amongst the elements of nature? And as for evaporation, the dams will lessen more than increase it, as they deepen the rivers over beds of warm limestone-rock, and thus destroy the present influence of the hot summer sun of Canada; exhalations are trivial from the surface of lakes, compared with those from shallow rivers.

Thus is this Canal formed by dam and lock, and not by locks and cuts, as in England. The land drowned by the raising of the dams is not worth mentioning, consisting chiefly of swampy wastes, the haunts of otters and beavers.

Were Canada a country where floods and freshets are obnoxious to works placed in the beds of rivers, it would then be proper to shun the rivers with the works; but this is not the case. Floods there certainly are, but as these come periodically, they can be calculated upon with the greatest certainty; guard-gates and sluices can be fixed for their re-

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ception. Dams even destroy the effect of floods, for, as they form extensive lakes, the floods in getting through them expend their fury. Thus the Great Rideau Lake, the summit reservoir, which averages 24 miles long and 6 broad, only rises, with the greatest floods, 3 feet; while, in narrow places in the River Rideau, the rise is from 10 to 14 feet: were, therefore, all the dams and lakes raised, the floods would never be deeper over the waste-weirs than 2 feet.

It has been stated that the Rideau Canal has been estimated to cost 169,000*l.*: this is perfectly true, and, if the works were executed in a weak and unsatisfactory manner, might, probably, be found sufficient; but if British substantiality is required—and required it always is—three times the above sum will perhaps not be found to be too much. How can it be otherwise? If any practical engineer is applied to, he will at once state, that to build a substantial, good lock of cut stone, similar to those of the Lachine Canal, and those proposed first for the Rideau Canal, will cost (excavation of lock-pit included) something near the sum of 6000*l.* Now, as the rise from the Ottawa River to the grand summit-level of the Rideau Lake is 283 feet, and the descent from thence into Lake Ontario 154 feet, making a total lift, as it were, for lockage of 437 feet, and con-

sequently requiring about 47 locks of 9-feet lift each, requiring the above sum of 6000*l.* each, the chief part of the true estimate is shown at once; and if the price of the dams, excavation, land required, mill damages, &c. be added, the full estimate will be readily obtained, and will appear to be nearly the sum already represented. And is this sum too much? Was there ever an inland navigation about one hundred and sixty miles long, having forty-seven locks, constructed for the sum? Never. Here, the main expense is lockage; the whole excavation in the above distance exceeds not eighteen miles. Perhaps the Erie or New York Canal, the boast of the States of America, may be brought forward to disprove this; but let them be compared with a due regard to the substantial nature of the work. Again, the Lachine Canal—and a better constructed one is nowhere to be found—although only about nine miles long, and having seven locks, cost 130,000*l.*; and it could easily be shown that this was not too much, considering the country in which it was situated, and various other circumstances which do not affect a British Canal. The Granville Canal too, now in progress, and which will, when finished, be nearly equal in extent and dimensions to the Lachine Canal, has already cost 80,000*l.*, and is not yet above one half completed.

Can it then be possible that sensible people should suppose that the Rideau Canal can be constructed at an expense four times less in proportion? On the contrary, as its route lies through a much wilder tract of Canada than that of either Lachine or Granville, it can hardly be expected that it should be constructed at even the same ratio. But, had the original line of the Rideau Canal been followed—the line from whence the estimate of 169,000*l.* is deduced, I will undertake to point out five miles of it, which alone would swallow the whole of the estimate; and will even venture to state, that if that route, which was chiefly cutting through a rocky wilderness, had been adopted, it would almost have exhausted the British treasury. It is a great satisfaction to me, that, by a concurrence of circumstances, I became one of those persons who discovered the injurious scheme into which my country was about to be dragged, and in some measure contributed to preserve science from abuse, character from destruction, and government from an enormous expense.

I never was a great advocate in favour of the large locks for the Rideau in preference to the small, as first proposed: had there been but few locks required, the large might be preferable; but there are too many, and I am afraid the trouble of opening and shutting them will turn out to be great.

The small locks would certainly have sufficed to pass a great deal of wares through them in a very short time; while on the large sheets there might have been steam-tugs stationed to drag on the rafts of lumber and fleets of barges. These locks would likewise have corresponded with those of the other Canadian canals. It is true, that towing-paths cannot be had through the extensive lakes and marshes of the Rideau; but then the locks are so laid out as to be in numbers together, which not only saves the expense of wing-walling, but also concentrates trouble; when once the barges had passed a lot of locks, a convoy of them might have been led along by the steam-tug. However, the large lock is now the one being constructed,—let it be so,—but the Grand Canadian Canal is not the Rideau Canal, nor the Welland Canal. These are only mere sections of it, which are to be met with on the grand line between Quebec and the noble summit-level of Lake Superior. This famous Canal will be finished in a few years as far as the summit-level. Steam-boats may go up from Quebec to Lake Superior ere three years from this time; from thence with little trouble, they will pass through the *notch* of the rocky mountains and be locked down the Columbia to the Pacific ocean. The route, however, will be better to be kept off the Ame-

rican frontier, which is Columbia, and to go down Cook's river, or the large Salmon river at Nootka Sound. The town of Nootka is likely yet to be as large as London, and ought to be laid out on an extensive plan, as the trade between it and the Oriental world may become wonderfully great, in a short time. Then when the steam-packet line is established between Quebec and London, as it soon will be, we may come and go between China and Britain in about two months. The names of the stages will be London, Cove of Cork, the Azores, Newfoundland, Quebec, Montreal, Kingston, Port Dalhousie, Port Maitland, Erie, Huron, Superior, Rocky Mountains, Athabaska, Nootka and Canton. Can this be called a foolish prophecy, or an idle dream?—By no means; it is perfectly practicable. The magnitude of the whole may probably be too much for the minds of the generality of mankind to grasp; but what signifies that? Were the work absolutely finished, millions would not believe it! Pagans consider the sun in a different light from Astronomers. The eyes of both are dazzled by his beams, while his real nature is unknown,—as far beyond the understanding of man, as he is in miles from the earth, and probably much farther.

SOCIETY FOR THE PROMOTION OF
NATURAL HISTORY.

SOON after my arrival in Canada, I proposed the following questions to the public, through the medium of the Montreal Herald, a newspaper published twice a week, edited by my friend Mr. James Scott, a gentleman from Glasgow of the first-rate editorial talents; remarking at the same time, in the outset, that by promulgating such, it might help to "show to honest John Bull the extent and natural worth of his immense domains on this side of the Atlantic. He shall not be kept blindfolded as he has been—he shall not be allowed to send water-butts to his fleets on the lakes, for he shall be told whether their waters are fresh or salt."

"What has become of Hearne, the Mungo Park of Canada—who explored the Coppermine River, and first saw the Frozen Ocean—who wrote one of the most interesting books of travels now extant? Is he alive?—if so, where? and what

did he do after returning from his travels? Is he dead?—where did he die? Is there any account of him to be found in any periodical work?—if there be not, he has been a much neglected man. We have heard much of Mackenzie and Franklin, but can any one say any thing of Mr. Hearne?

“Where are the salt springs of Canada—in what Townships? and where are they considered strongest? Is there any salt made in the country? and whence do the Indians sometimes bring rock salt with them down their wild rivers, and expose it to the civilized community?

“Where are the Mineral Fountains—are there any?—and are there not phosphoric burning springs?

“What are the causes of the Lake Fever?—can it be considered as marsh malaria, or does it differ?

“What are the Rocky Mountains?—have they been fully explored?—is there not a large notch or breach in them beyond Lake Superior?—do not rivers rise out of them which flow both into the Atlantic and Pacific?—have not valuable ores and minerals been discovered in their neighbourhood?—are they not sufficiently interesting for rummagers to search for them?

“What are the names of the trees, briers,

shrubs, plants, herbs, flowers, mosses, &c. which are or have been found in the country? Let the local names be given, as *prickly ash*, *spotted alder*, *pitch pine*, *curly maple*, *winter green*, &c. Let the reasons for such names be expounded, and their qualities told; let specimens of about six inches cube be obtained of each tree, and let the name be stamped on each; let the leaves be preserved in a book, and the berries in spirits of wine. Let sugar maple be thoroughly considered, and let it be ascertained whether or not the juice of the sugar maple would make a spirit by distillation equal to the best Jamaica rum, or Craigdarroch's Peat-reek at Perth. If so, let it drive the Yankee whisky into the lakes, even though it might poison the pikes there. Nevertheless, let what the people of the States of America call cocktail be fully analyzed—let us pry into the wonderful mysteries of *Bitters*.

“What are the local names of the fishes? Let *black bass*, *mosquenonge*, *fresh water herrings*, *salmon of the lakes*, &c. be examined. How are fish speared? and will the heat of the sun dry them?—are they taken beneath the ice? and are not the Indians *lords of the islands* of all the rivers, and of the fish that swim therein?—do the fish horde up little stones in the rivers? and are not the best fish always found in the best waters—

sharks in the wild salt wave, but trout in the lovely brook ?

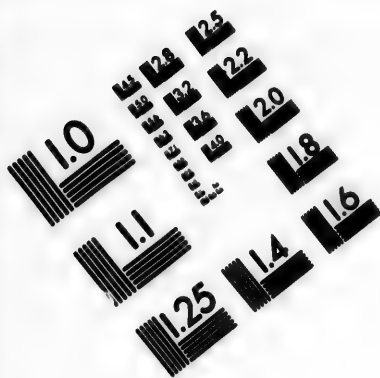
“ Who will be so good as to write an elaborate essay on Athabasca, stating the boundaries of the same, the Indian tribes in that wild district, the nature of the rivers, soils, trees, animals, atmosphere, &c. with every other information that can be obtained ?

“ What sort of a country is that about Fort Laprairie ? Say what is the nature of those extensive meadows of Asniaboyne. Are there no trees there ? and what are the grasses on the meadows ? are these havannahs nigh, or on the banks of the Red River ? Let a proper description of the herds of buffaloes which graze there be given, with the manner of catching them, and also the wild horses.

“ How many posts have the Hudson's Bay Company ? Where are these situated ? and what are the names of the clerks at the various posts ?

“ Are there any clerks who belonged to the North-west Company detained by any tribes in the North-west, and not allowed to return to their friends ? Why are the Scottish Bois Brules the most savage of all the Bois Brules ? A half-bred Canadian has ten times more humanity. A Highlandman and a *squaw* beget an infernal progeny. What is the cause of all this ?







“ What is the extent of the Columbian River ? Where does it rise ? What are the colour and taste of its waters ? Has it many rapids ? Has it any fish ? What are to be seen on its banks ? Have oaks sixteen feet in diameter been seen there ?

“ The mineralogy of Canada must be explored. It is full of valuable mines. Coal seems rare. Does any one see or hear of any specimens of *sea coal* ? Where are the best grind-stones to be had, also mill-stones, hones, slates, granite, free-stone, marble, flag-stones, &c. ? Where is good clay for brick-making ? and is there not fire-stone ? Would not the hollow cedar answer for *shanty chimneys* ? Why is it not used where no stone is to be had ?

“ What are the names of the animals from which fur is derived ? Tell us about the *black* and *silver foxes*, and let whole pages be written about the musk rat ; also of all other kinds of martins, &c.

“ Are there rattle-snakes in the country ? and what is a nest of rattle-snakes like ? Are there any snake boots made ? Are the tales of snakes from the Ohio country true, or are they *stretchers* of Jonathan ? Let all serpents, whether of water or land, be examined.

“ What are the windfalls ? Do they sometimes

lay waste the forests, for miles in breadth, from one side of the province to the other? Are there *frost-blows* in the intensity of winter, as there are sun-blows in the tropical climates? People are said, at least, to have been frozen to death in an instant.

"The birds must be considered, and proved whether the partridges belong to the pheasant or turkey brood. Where do the wild turkeys take up their abode, and what are their habits and general manners? The flocks of black-birds, too, must be examined; they seem to be the rooks of Canada; there is more of the starling than thrush about them. All woodpeckers, whipperwhails, blue birds, snow birds, bats, robins, carrion crows, kingfishers, &c. must be obtained, and their nature investigated.

"The bees are to come under philosophical examination. Do they not thrive amazingly in this country? Hives multiply vastly, and is there not a method of translating them to hives without using *Bonar's* system? May not lots of mead be made? Spiders and all the insect tribe must be laid before the microscope, and the *black fly* and *musquito* well deserve to be anatomized.

"Have Nootka Sound and Cook's Inlet been fully explored by rummagers? If not, the sooner they are on that coast the better. A

history of Hudson's Bay would be gratefully received, and all journals, notes, diaries, paragraphs, &c. of travellers will ever be welcome.

"An Encyclopædia is to be published, called the *Canadian Encyclopædia*, in which all the articles will be arranged according to the alphabet, neatly printed, with plates, &c. Contributors will be paid for their labours. Some of the articles will be headed thus:—*Furrology*, or the science of furs; *Stumpology*, or the science of stumps, &c.

"Such are proposed to become the transactions of the Society at its outset; and all young men in Canada, who are enthusiasts in Natural History, Natural Philosophy, and Mathematics, will receive every encouragement, and will be fitted out on expeditions to explore woods, waters, and wilds, for which they will be liberally rewarded."

After these questions were published a few months, there were two answers given, of a very unsatisfactory nature, respecting the eminent traveller Mr. Hearne. They both agreed that he died in London, that some account was given of him in some magazine; but no dates were mentioned. I am determined the matter shall not yet rest; he shall be searched out, and a proper memoir of him given, as he surely deserves it.

The notices respecting this excellent traveller were the only ones that appeared in answer to any of the questions ; but I am inclined to think, that they set enquiry on foot in all directions. A "Society of Natural History" was formed afterwards in Montreal, and I felt highly delighted on receiving the following letter.

" Montreal, August 9, 1827.

" SIR,

" I HAVE the pleasure of informing you, that at the last meeting of the Montreal Natural History Society, you were unanimously elected a member.

" I take the opportunity which is thus afforded me, of requesting your assistance in aiding the designs of the Society, by collecting specimens for its Museum. Your situation on the Canal may afford means of acquiring valuable minerals, which will always be highly acceptable, particularly as the Society is more exclusively designed for the promotion of the Natural History of the Province.

" Any other object of Natural History which might come in your way, would be acceptable.

" I am, Sir,

Your obedient servant,

A. F. HOLMES, M. D. *Secretary.*

" J. Mc. Taggart, Esq."

It will be seen in the course of this work, how far I succeeded in obtaining information respecting the queries proposed, a part of which may be given at present.

Salt springs are numerous in the country. A very fine one is at St. Catherine's, Upper Canada, at the Welland Canal. Much salt is also made in the United States, from the salt springs at Utica and Canandague; but they can hardly furnish it so cheap as it can be brought from Liverpool. The Indians bring rock salt with them from the Rocky Mountains—I have a specimen, kindly given me by one of the Chiefs. The *Deer-licks* in the wilderness are places where the deer assemble to lick the salt moisture oozing in various parts out of the earth;—at such places, the hunters gather for another purpose.

There are various mineral wells discovered, chiefly of a chalybeate nature: one in the district of Cornwall is famous, and much resorted to by invalids. I found out a very good one in a *rocky snie* at the Falls of Chaudiere. There my worthy friend Dr. Christie analyzed it in various ways: he boiled it down and showed that it left a red precipitate behind; particles of iron adhered to *Mrs. Frith's magnet*, when put into it, and gin was turned to the colour of ink. The Doctor

said that this proved the deleterious quality of the gin, and showed there were some vegetable products in it that ought not to be ; and as he was *Dean of Guild* in the honourable corporation at *By-town*, the mineral waters aided him in his vocation, and were the means of bringing more genuine spirits to the city of By. " Confound the Doctor, Mactaggart, and the *mineral spa* !" was the phrase got up on that occasion. The Indians tell me of valuable fountains with which they are acquainted in the wilds. It is generally conceived, that a country liable to diseases has also some things in it for a remedy. These mineral wells may be, and I believe are found to answer well with the invalid long afflicted with the *fever and ague*. If this one which I found at the falls proves to have any healing virtues, these, and the lovely situation of the place, may induce multitudes to frequent it.

The lake fever proceeds not from marsh malaria, but from a kind of putrefaction that takes place on the large fresh-water lakes during the hot season. If we visit these lakes shortly after having come off the salt ocean, we smell the effluvia that creates the lake fever ; while those who have been long in the habit of residing near them, feel it not.

The Rocky Mountains ought certainly to be explored as soon as possible. I have valuable silver ore with me, given by an Indian who resided amongst them; he had also minerals with him that I knew nothing about. My dear friend Mr. Fleming, of the Trent, who has often been over them, declared to me, that he and a party of *voyageurs* discovered a notch, which led them through from the Great Lakes to Black River, which falls into the Columbia. I have no doubt that as valuable mines may be found there as amongst the Andes of South America.

Sugar-maple rum may be made of excellent quality, but whether to match *Craigdarroch of Perth*, I will not say. The latter is the name of a whisky made after the Glenlivet mode, by Mr. Fergusson, of Perth, Upper Canada; the flavour is very good; it is by far the most excellent spirit distilled in the country.

Mr. Thompson, the astronomer, repeatedly told me, that often when he was on the Columbia, striking the boundary line between Canada and the States, he has seen many pine-trees that it would require a cross-cut saw *sixteen feet in the blade* to do any thing with them. Now this gentleman is generally considered to speak something

like truth ; however, I should be glad to see these large pines with my own eyes.

In order to obtain a method to extract *stumps* from the earth, those bugbears of the American farmers, they have exhausted their mechanical genius in vain, and it is generally believed that the best plan is to let them rot out at their own leisure.

The wild beasts of Canada are not ferocious ; a person may lie down and take a comfortable sleep in the wildest, darkest jungle. I have never heard of any one being disturbed by bear, wolf, or wild cat ; and these must be considered to be the only savage beasts in the country that would be apt to break through the rules of good behaviour. The wolf of America is larger than that of Europe ; he keeps in the deepest forest during day, sleeping amongst loose mountain rocks, where the bushy hemlock hinders a ray of the sun from penetrating through the gloom. At night he bestirs himself, and prowls along the banks of the rivers and lakes in quest of deer, of which he is fond. I have frequently heard a pack of wolves in full cry after a deer, and once beheld a large one in close pursuit of a buck on the *glare ice* of the Mississippi Lake. The deer could not keep its feet, the ice being without snow so very slippery. The wolf, therefore, soon came

up with it; they struggled hard, but the savage effected its death before we could reach it in the sleigh. He did not observe us until we were within twenty yards; and then, with his tail curved between his hind legs, he skulked reluctantly away to the forest. The wolves have been known to be very troublesome amongst the sheep in remote settlements. I went out one morning with an old farmer in the Lower Rideau Settlement, to see the remains of three of his sheep that had been worried during the night. Nothing had the greedy savages left but the skins, backbones, and parts of the skulls. At the Lake of Chaudiere, I met with three Canadians who had captured a very large one alive; they had bamboozled him amongst the deep snows, and, after tying his legs with a cord, and securing his jaws with another, they placed him on a temporary handbarrow, and moved away with him highly delighted, exclaiming as they went, "*Le loup! le loup! sacré le loup!*"—"The wolf! the wolf! damn the wolf!" There is a reward in cash given per head for slain wolves by the Provincial Government.

The black bear is not like the wolf; he has degenerated in the New World, and is a very insignificant animal; sometimes he is known to steal out of his hollow tree in the woods, and

feast upon a young pig or the like. The boys are so little afraid of him, that, when they find him in his den, they will surround him with sticks, and thresh the life out of him. Often, again, they will secure him, like the wolf lately mentioned, and sell him as a pet to the bear-fanciers for half a dollar or so. In Montreal, bear-hams sell well, and are considered by the *kitcheners* of Canada exquisite in their way. The Indians tell me he takes great delight in destroying the wasps' nests. It seems to be a favourite amusement, as all the food he obtains from the destruction of them would but ill repay him for the stings he must receive; but they think he does not suffer so much this way as they do, which may be true. As to wild cats, I have never seen any: the Indians say they are rarely to be met with, and never but in the neighbourhood of rapids and precipices. While exploring the famous Rapids and rocks of *Chats* (the French name for these animals), with my friend Mr. Sheriff, we expected to fall in with them, but were disappointed. These are the most beautiful rapids I have seen; the Ottawa coming roaring down a height of near eighty feet, while quite across the river, from shore to shore, which is about a mile, the rapids and falls are broken and divided by

numerous islands covered with green trees, and the water dashing white around them.

The mosquitoes are very numerous during the hot months of summer in the uncleared country, and in that too partly shorn of the woods. They are extremely troublesome, and nothing hitherto discovered will prevent their biting the exposed parts of the body. The Indians and French Canadians, who may be called the natives of the country, suffer almost as much from them as newcomers, but their flesh does not swell so. People from Britain are frequently to be met with nearly blind from the poisonous effects of these insects. It is vain to rub the skin with grease or camphor; they mind it nothing. Some will fling veils over their faces; and these would keep them off, were not veils troublesome things too in hot weather to wear; they confine the breathing, and add an additional warmth to the cheeks that have no need of it. Nothing will keep them at bay but the strong, *smudging smoke* of fire; nor will this do unless we completely envelope ourselves in the midst of it, which is not very comfortable.

In Europe, the cattle run to the hill tops to get rid of the flies, but in Canada they move towards the smoke. How contented will the old horses and cows hang over the smouldering embers, neighing and lowing for perfect joy. When the weather is

damp and moist, they get numerous; the swamps and little inland rivers are perfectly covered with them. In these places they are considered to breed. In dog-days they are not so troublesome: towards the latter end of August they are at the worst, and larger grown than in the spring. They are extremely greedy; if with a pair of sharp scissors we clip away the half of the body of one that is sucking, it will not desist and attempt to fly away, but continue to suck for hours, the blood flowing from where it was severed in two. It is said that they have succeeded in killing animals, nor does this seem at all wonderful, when their virulent nature is known. Night and day they are equally annoying: it is in vain to go to bed at any prescribed hour, for no sleep can possibly be obtained, unless we are completely fatigued out; and when we wake, the face is covered with blood; and if the hands or legs be exposed, they are rendered frightful to look at, and the feet will not go into the shoes or boots they have been accustomed to. Settlers in the heart of the woods suffer dreadfully from them; they keep a *smudge* always at the threshold of the door of the dwelling. The *black flies* are almost as bad as the mosquitoes; they are not such a large insect, nor so poisonous. When examined with the microscope, the mouth is not unlike that of

a bull-dog ; whereas, the other sucks with a proboscis. The *sand-fly* is something like the cheese-mite ; the skin feels itchy, but we know not the cause, and sometimes even rub the skin off in order to get rid of them. The *gadnipper*, a large species of gadfly, is also common, but not so troublesome as those above described.

There are various other flies in the woods, but they seem to be without names. There is one kind, however, which, wherever it alights on the human body, causes a blister as large as a kidney-bean in a few hours, nor will it fall away for many days. When such occurs to strangers, it is some time ere they know the cause it proceeds from : this is probably a species of the cantharides.

Mr. Waterton, the naturalist, has my warmest thanks for his able vindication of the character of that curious bird the woodpecker. It certainly does not injure the forest-trees by boring them full of holes. Those trees which are in a state of decay, chiefly from sheer old age, are the only ones which are paid attention to by the woodpecker ; for these are the same in which its insect food is bred. The green thriving trees will not produce it a meal ; indeed, it is too knowing ever to bother itself by alighting on such. It knows the trees that are likely to produce food even when on the wing—an excellent judge of timber infected with the

dry-rot. Now this bird not only selects trees infected by the worms, but by doing so, promotes their decomposition, and so succeeds sooner in clearing the forest of incumbrances. Without this bird, the trees running to decay would not moulder so soon, for the rain gets into the holes made by the bird. It is very voracious, eats away the whole day, and never seems to weary. Where it finds a fertile stump of worms, it will not leave it, but continues to dig in, until it is buried out of sight. Often have I witnessed its greediness carrying it thus far, and cautiously creeping up, have succeeded in covering it with my hat, if it was not too high up the trunk of the tree, as it generally was. When inspecting a tree, it hops down the trunk in perpendicular hops of about four inches each. In this work it is much assisted by the feathers of the tail, which are kept turned into the tree; by which the feathers have all their soft down near the top worn off, and the stems left very sharp. They act as shifting props, assist its holding by the sharp claws of the toes, and steady the bird in its laborious operations, where the standing ground does not afford it a platform. This bird makes *two* distinct noises with its beak on the trees, the meaning of which is perfectly different: the one may be called *tapping*, the other *drumming*. The intention of the tapping is to bore through the bark

of the trees, where that bark partly adheres to the tree; the other is beating or drumming furiously on the hollow bark, so that the insects behind are frightened, or fall down to where the bark adheres to the tree, where they are received by the bird. Now the reason of this is obvious; for if it tapped a hole where the bark was hollow, it would find no insects behind, they would hear their common enemy and scamper off; whereas it knows where to frighten, and where to catch them. This drumming of the woodpecker has often astonished me in the wild woods, and it cost me some attention to discover the cause of it; but I found that where it drummed, there were no holes,—that these were farther down the tree, in belts, where the bark was in the situation I have stated.

The woodpecker is one of the most ingenious of birds; it is not every hole in the trees that it will build its nest in. Those standing erect, partly remote from the rest, very much decayed, with no top branches, are selected for the great purpose of breeding in. A hole is bored into the tree, about two yards from the top, sufficient to admit the birds to their nests; and immediately beneath this, for the same distance down the tree, it is pecked into an inverted curve all round, the top of the tree somewhat resembling a sand-glass: this is done in order to prevent the squirrels from visiting them.

This quadruped seldom runs up trees which are in a state of rottenness ; however, when it does, this ingenious curve puts an end to the ascent, as past that it is perfectly unable to go. Its claws will not hold so well in decayed wood as in fresh; and when it is partly obliged to move on, or back down, there is every likelihood that it will fall.

I have always continued to write to my humorous friend Dr. Dunlop, of the Canada Company, when any thing of note happened. When the before-mentioned Society was formed, the following was sent to him.

“ MY WORTHY DOCTOR,

“ ALLOW me to pay you my best respects. I am got into the world of civilization again, so I must behave like a friend and gentleman. Like yourself, I have been rummaging since May, and have discovered many, what I conceive to be, curiosities. How came you on by the Huron?— I heard of your murder, but disbelieved the statement. Heaven keep you well ! I long to crack a night or two with you. When shall I have that satisfaction? Is it not astonishing that you and I keep our health so well ? To think of persons like us, inured to all the sweets and luxuries of London, launched out to Canada to raw pork, Yankified rum, and a soft bed of leaves beneath the wild-

wood tree! True, 'tis 'habit is every thing.' How is our dear Galt? I have written to him, but as yet got no answer. Has he finished his novel of 'The Settler?' That character, the *Indian Witch*, is true poetry, Doctor. Has he a play ready for Quebec this winter? if he has not, stir him up, or write one yourself. Keep out Yankee characters; poor creatures! they cannot (like the Scottish and English) bear to be laughed at. The good people of Montreal are to be treated to a comedy of the Convener's. You have seen the sketch—'Humours of the Grand River, or a Trip to Athabasca:' the thing is now in rehearsal.

"The land is good, you say, about the Speed: I always thought so; settlers will do well there. On the whole, your Company is going to do wonders in Canada; there never was a better one formed; I think more of it than the East India Company. Canada is a valuable colony; in fact, she is at the head of all the colonies, for she has the means to protect all the rest, and to give a consequence to Britain not to be sneered at. Politics here are making a stir amongst the cobblers—I never mind them. What are Canadian petty politics to those we have dabbled in? When we are politicians, we are so indeed. I believe, however, our worthy Governor has had his own vexations of late. Some French bodies have been bothering

him. I do not like this; I like the French Canadian very well,—a kind, thoughtless, light-hearted soul; but there are busy, meddling, evil-disposed characters amongst them. We have clapped them too much of late,—this spoils them. We must always keep a respectable distance; and when a mutiny appears about any thing, the best way to have peace, is just to take the North-wester's plan—dash into the mob, and knock the first down you meet, with a whack beneath the ear, when quietness is restored in a twinkling.

“When we meet, which will be before Christmas, I hope you will give me a glimpse of your journal; it must be extremely amusing, and no doubt you have curiosities of the greatest value extracted from the depths of the forest. A Society of Natural History has been established here, and we have the honour to be elected members: I like this very well, and am only sorry that we have bound ourselves so firmly to the Royal Society at home, that I am afraid we cannot do our duty towards it as we ought: however, we shall do our best. I am extremely happy; never was king prouder than I to inform you that I have obtained one great object of my mission to this country, namely, a *Canadian hoolet* as big as a gander.

“Peace be with you, Amen.”

SETTLERS AND SQUATTERS.

SETTLERS come on better by planting themselves down in large communities from one and the same country than by any other plan. The Irish thrive well in Monaghan and about the Rice Lake. The Glasgow weavers revel in Lanark, along the Banks and Lakes of the *Massapi*, vulgarly termed Mississippi, while the Yankees generally agree with Upper Canada, and the French with the Lower Province; Highlandmen cling by Glengarry, and so forth. Where a number of people who are of one way of thinking, whether as regards the affairs of earth or of heaven, and who have the same habits, customs, and manners, club together, there is commonly found more peace and contentment than where there are intermixtures. I would, therefore, advise settlers to consider this before they locate themselves; find out your countrymen, seek

for the largest nest of them, and there take up your abode. I do not mean that because you are a native of Scotland you are to go exactly where Scotchmen are: you are to be stricter than this; you are to set yourselves down near those who have led such a life as yourself, and whose wants are similar to your own. The word is, "Go not to Glengarry, if you be not a Highlandman."

There is a fault emigrants have, of wandering up and down the country for months before they think of fixing themselves. The agents of the Canada Company, it is to be expected, will, by giving them proper information, do away with this. There have often strange reflections come over me when observing people prowling about in quest of land, to be *lairds themself*. This is a wonderful matter; and although land in Canada is of very little value, comparatively speaking, to what it is in England, yet when a poor creature receives a grant, he is little less in his own conceit than the King himself, or the first Governor in the land. He lays on lustily with the hatchet for a year or two, but then begins to weary. Still his love for the farm is as great as ever. He will allow no one to cut a stick off it, if he know; and if any tell him, the guilty are sure to have a summons in their hand in a very short time. If a road, or

any thing that way, affecting the lands, is proposed to be run, the problem is studied with more anxiety than at home.

The best settlers who can go out to Canada, are those who have been *badgered* and abused in Great Britain, and who, spite of all their misfortunes, have a little cash left. They will there find all the animal necessities of life without much trouble; that is, enough for back and belly, though but few comforts for the mind: so, if they have been harshly treated at home, they regret that home the less, and resign themselves to their fate with a considerable share of philosophy. If they go out with cash, and have not been kicked and scorned at home, they will certainly become growlers in Canada; and this is the cause of the greatest part of the discontent that prevails, although there are a number of the emigrants naturally discontented people, and who would be so in any country. Friends, associates, churches, schools, news, &c. are not to be found in the remote settlements; and these are things which tend greatly to the comfort of the human mind. What are plenty of pigs, poultry, and bread, when a social party cannot be formed to partake of a feast? The *good man*, if a Scotchman, would like to enjoy a glass of *whisky toddy* now and then with a neighbour; the wife, a cup of tea; then the dear lasses, Mary, Nelly, and

Peggy, where are the lads coming about to see them in the evening? Perhaps a Yankee may pop in his long razor-nose, and guess "as how they are omnipotent:" this is not a touching strain; it is colder than frost itself. The love of Jonathan is indeed small; I have never seen him or his females the least thrilled by this the most heavenly of all passions. They marry, to be sure, and have families; but what of that? brutes have the same. There is generally a settled kind of sulkiness about the Americans; they seem downcast some way or other, seldom if ever laugh, and hold no conversations about the real pleasures of the soul. When they talk of females, their sentiments are abominable; they appear to hold a constant warfare against the laws of nature, so that they will neither feed, clothe, nor house themselves according to the climate.

The French Canadians, on the contrary, pay great attention to this, and live in comparative happiness. Those who emigrate from Britain ought to follow their example; would they do so, they would live much more comfortably than they do. It has been argued that if a whole parish emigrated in a body to Canada, clergyman, *Dominie* and all, happiness would ensue, and the whole would live in the greatest harmony together. This has, it may be

said, been tried, but it will not do. One farmer is more industrious than his neighbour, his wife and daughters get better dressed: scandal and jealousy thus arise, and who can allay them? The church is *cold* in winter, yet the clergyman insists on their coming to it and hearing his doctrines; the more he complains of a small congregation, the less it becomes, till disputes arise, which have no termination. Then some boys at the school are better learners than others; the parents blame the dominie for want of attention, he leaves the parish, finds teaching elsewhere, and no one is found to replace him: these and many such things create growling, and to a greater degree than is heard in any parish of Scotland; to account for it fully would be difficult. In Scotland a parish has its character to support; but, let it behave in Canada as it may, few will find fault. No one will there blame you for not attending the church, nor care whether you educate your children or no; rivalry is out of the question. If you like to live in elegance, no one will care, nor praise your house furniture, or say unto thy Turkey carpet that it is beautiful. Nay, Jonathan will squirt tobacco-juice at thy splendid fender, nor care to drive his *white hat* through the face of the looking-glass. Preachers may preach, and schoolmasters teach, but what

avails it? The way to Heaven is considered by no means very complex, when people think little about it; and as for Latin and Algebra, yea even common English and the multiplication table, they are not respected. The young men have no expectations; they have no interest in the old world beyond the flood; yet all the situations among them worth any thing, are filled by people sent from thence; so they are led to regard both with indifference. They are never heard to praise either Britain or Canada.

Without some object in view—without emulation—the functions of man fall asleep.

A settler of eminence in Canada is a kind of monopolist in his way. He has a grist-mill to grind his own and his neighbour's grain;—a saw-mill, wherewith he furnishes boards for those who are building houses in his village; for every big man must have his *clauchan*, as the Scotch say, and give it *his* name. He has likewise a fulling and carding-mill, for preparing woollen yarns for cloths of home manufacture; a smithery and *trip-hammer*, which is a large sledge-hammer, driven by the power of water, applied to necessary machinery; also an ox-shoeing stall, or place where the oxen are fixed by belts, and their feet by chinks, until they are shoed. These engines he

obtains by procuring for himself, in the first place, a *mill-seat*, or what the Yankees call a *hydraulic privilege*, which he enjoys by setting himself down by the side of a rapid of some river or other, as there he may erect as many mills as he pleases. There are few estates of any extent in the country that have not plenty of mill-seats on them; indeed, there are more mills erected, in many instances, than there seems to be work for. But mills alone by no means complete the finished establishment. A distillery is a thing quite indispensable, so that *raw grain* whisky may be produced at a couple of shillings per gallon, the flavour of which is qualified by frosty potatoes and yellow pumpkins. Such *aqua* is extremely delicious; and those who know what *Glenlivet* is, may, perhaps, touch it with a long stick, confining their nostrils at the same time. A tannery is also an appendage; while a store may finish the list. In this store is a lot of goods from Montreal merchants, to give in barter for the productions of the townships—*white hats* for Yankees, black hats for Irish, and Kilmarnock bonnets for Canadians.

It is an old remark, that people who have "too many irons in the fire at once, never thrive," which

is the way with those having these regular establishments. A man cannot be both a farmer and a fisher; neither can he be a farmer and a miller, nor yet a farmer and a *lumberer*. One trade is always quite sufficient; and the twentieth part of one, if properly attended to, will procure a fortune in London.

I am happy to find, by a late act, passed in the Provincial Government of Upper Canada, that potatoe whisky distillation will be almost put an end to; for this is the absolute poison of Upper Canada,—the laudanum that sends thousands of settlers to their eternal rest every season. There is a particular charm about the name of whisky, which Irishmen and Scotsmen feel more strongly than the natives of any other country: which is one of the causes why this infernal liquid gets hold of and overcomes so many of them as it does. But look at the affair. A Scotchman plants himself down in the *bush*, but often thinks of his old habits in the old country. A Yankee comes about with whisky to sell:—can Donald withstand this? No; he would drink it—he would drain it to the dregs, were it fire and brimstone; and it is a distillation little better—made of frosty potatoes, hemlock, pumpkins, and black mouldy rye.

No hell broth that the witches concocted of yore,
can equal it. They never put such ingredients in
their cauldrons,—

“ Bubble, bubble—toil and trouble,
Fire burn, and cauldron bubble.”

Squatters are those who come to the country for the purpose of becoming settlers; but, not having wherewithal to come by a grant of land in a regular way, set themselves down where they think it will best suit them, on unlocated lands, or those not in a state of any cultivation. I have frequently thought that the squatters go to work the best of any: they deprive the clerks of the Land-office of all fees,—a thing they deserve; and, instead of being pointed out farms on *diagrams*, where, probably, no such things exist, or, if they do, are not worth the cultivating, they go forth their own surveyor into the wilds, and where they meet with a fine river, a fertile valley, and cool spring well, squat in contentment. Years may roll over before they have a chance of being molested by any one; and should they be, they always obtain their farm at a fair value, possession being nine points of the law.

Wandering through the woods, in the winter of 1827, we came upon the track of a sleigh; and as we all believed ourselves far from the abode of

settlers, we were almost as much surprised as Robinson Crusoe was with the print of a man's foot on the sandy shore of his lonely isle. We followed the track for a mile or two, and at length came upon a clearing of about seven acres in extent, near the middle of which a neat little log hut sat smoking. About fifty yards farther on, there were a few small houses huddled on each other; but these did not seem to be human dwellings—the grunt of a hog and the crow of a cock proclaimed their purpose. We were met at the door by a man about the age of forty: he was clean dressed and healthy looking; in one of his hands was a child about five years old, and in the other a hatchet; he asked us with a tremulous, yet kind voice, to "*come ben.*" This emotion arose from his not being in the habit of seeing company, as Almack's has it. We all marched in, and there was a snug little cabin, with a wife, two more children, some good sleek grey cats, and a very respectable-looking dog. Having broached the rum-keg, we sat down by the fire, and enjoyed the man's narrative over a glass and a pipe. His name was Peter Armstrong, from the town of Hawick, Scotland. He had been fifteen years in Canada, was just a plain working man, saved as much as paid for his passage out, and fought up

the water St. Lawrence to a place they ca'ed Perth, and there finding nought ado—*nae country wark*—he just went afar into the heart of the wild woods with his axe, dog, and gun, and after looking about him, fixed on the place where we found him for his abode in this world. There he built a little hut, not the one he then was in, but one that the *pet-deer* had; for he had tamed many deer. Year after year he wrought away all by himself, read the Bible every Sabbath-day, made a journey to Perth twice every year, and bought wee needfuls; at length got a horse and sleigh, and cleared about four acres of the woods: this was five years after he had come to the place. He had but few wants, his health was aye good; there was spring-water plenty just aside him, and enough to make a good fire in winter, while with what he caught, shot, gathered, and grew in the yard, he lived well enough. All at once, on one of his visits to Perth, whom should he meet but Tibby Patterson, *wha was the byrewoman at the Laird of Branksome's*, where he was once a herd-lad: it is needless to add, they had met far frae hame in a wild land—they had few friends—so Tibby just came awa' with me to the woods, and we just took *ane anither's word* on't:—that's the way we were married, and here we are, and have

been for the last nine years. We are contented, and that is enough; we are not much bothered, and Tibby likes to live in this kind o' way as weel as mysell.

I own this information gave me much pleasure. There was no melancholy, but a cheerful resignation apparent throughout; they were Christians of a very high character—both originals in their way. It was with difficulty we could prevail on ourselves to leave them; the same feeling that they had, was beginning to be felt by the whole party. Since meeting with these people, I have met with others in similar situations; but these have all been Yankees—they did not read any Bibles, nor sing hamely sangs like Armstrong and his Tibby; they were gloomy, ill-natured, growled a good deal, would not leave the woods and fight for an honest living and cheerful society, nor yet be at peace in them: there seemed to be something gnawing at the conscience—a venom, certainly, without any victim to rouse it into action. They gave no account of themselves, nor could I ever pump any out of them, but from one person of the name of Hammond: he certainly told his tale, but for the sake of human nature, I refrain from giving it. He had been in the wars of Canada, and once broke the *States' Prison*.

It was once after parting with some of those vile Cains, that the following letter was written ; it paints the gloomy side of the community, but it has long been thought that fair and foul are both required in an honest representation.

“ MY DEAR FRIEND,

“ UNLESS I cross the ocean again, there can be no hope of our meeting, for you will never come to this country, that's certain, and I believe the sooner I get out of it the better. Every true honest Briton here gets his feelings so hurt, go where he will, that melancholy besets him like the eastern Sirocco, and shrivels the very flesh on his bones. The natural beauties of Canada are indeed not to be matched in the world ; her forests, lakes, water-falls, and rivers are truly splendid, but her human population is composed of such materials, that to mingle with them is one of the severest punishments that can be inflicted on a feeling heart, and to associate with them requires either the firmness and deliberation of the philosopher, or the sneaking manners of the low uneducated vagabond. The cause of this arises chiefly from droves of discontented people pouring annually into the country—people, who from stress of weather, or more often from bad behaviour, are

obliged to quit the mother shore. These, on coming hither, meet with tribes of wanderers like themselves, destitute of almost every thing save pride and presumption, and boasting of something they term independence, which baffles me, I confess, to know what it is. All that Britain does, or proposes to do, for Canada, is laughed at; they would take from John Bull all the cash in his coffers, but would not thank him for it:—a cold, indifferent race, equal, any day, to Jonathan and his brood; in fact, I sometimes think them worse, and feel inclined to box them one by one as long as my strength will hold out. If you happen to travel on a rough tract,—a thing you generally have to do if you travel at all,—then the Government is blamed at every jolt for not making better roads; and the constitution of my country is sure to be cursed every time a carriage is upset by running over a stump. If you have to pass through a swamp, you will hear honest John blamed for not draining it; and if through a settlement made fertile by his influence, not a word to his praise will be uttered. Law without justice prevails greatly all over the country, and the villages swarm with lawyers; owing to the manner in which the lands are laid out and surveyed. Never were such codes of practical mathe-

matics displayed. Those gentlemen of the robe are to be met with everywhere in the country beating up for trade in law, much like English travelling merchants with their packs of prints and muslins. They fill their petty prisons with debtors, and scores are there incarcerated for sums not exceeding a dollar. Once I popped into a court-house to hear what was going on, and by so doing got my ears well filled with lengthened orations respecting an old dirty thief, who had stolen a shirt. I retired perfectly disgusted, from one of the most trivial scenes ever beheld.

“As to teaching and preaching, these are things but very little regarded: the best schoolmaster that ever appeared would be baffled, in my opinion, to make one solitary scholar; and the ablest pulpit speaker would succeed no better in making a good Christian out of a bad one, for the predominant feeling seems to be to detest all forms, trammels, and restrictions, and to trample under foot those glorious functions of man, which by making him lord of Creation, uplift him above the beasts of the field. When any of such characters happen to die, holes are carelessly dug, and the bodies tumbled therein, without any regard to solemnity. Churchyards are seldom fenced—few are the monuments erected over graves—and

the visits made by the living to the narrow beds of the departed, are, 'like angels visits, few, and far between.'

"Let those come to Canada who wish to study anatomy; here they may have as many subjects to examine as they please; here resurrectionists may do their duty in the open day, and no one will scare them. In winter, the French Canadians (and these are by far the most respectable people in the country, for what is worthy of human nature) lay their *coffined dead* in their churches until the thaws of spring soften the ground, so that they may be buried in an easier manner than when frost binds up the earth:—so the anatomist walks through the churches unmolested, and takes away to his dissecting-rooms as many subjects as he will.

"The French Canadians are a singular people. They scorn to improve the country, because it belongs to Britain; and if their farms happen to lie on the banks of rivers, they conceive themselves comfortably situated, as the rivers will carry away from them all the manure which they can throw into them, and so rid their hand, and the land, of what they consider to be a *nuisance*.

"In Upper Canada the feeling is totally Yankee, and the inhabitants care not a fig for the institu-

tions of Great Britain. In Lower Canada it is French, and there it is not much different with respect to England, only the French have better hearts, and are naturally of a kinder and more social nature than turn-coat Englishmen.

"I will not say, that the people of Canada wish that the country should belong to the United States, and that it should be taxed and governed by the laws of Congress; but it seems they would wish it not to belong to the present owner: yet I think they hardly want to manage and rule the roast themselves. The truth is, they are discontented, and know not what they want; they will growl and complain without any cause, purely for growling's sake. They are as able a set of grumblers as you can meet with in the world, and certainly deserve to be given up by Great Britain altogether; but this she will not do, as I think she will yet be able to make a reformation in the country:—not that she will reform the bad spirits, the insignificant spawn that is engendered in it. From her may yet spring up a race of wholesome characters, who will live unpolluted amid the refuse that may encircle them; who will hold up with manly front for the noble institutions of their native country; who will introduce common sense and morality, and be an honour to the nation they left, and a blessing to rising generations."

LETTERS AND REMARKS RESPECTING THE
AMERICANS.

“MY DEAR FRIEND.

“WHAT you have heard respecting the character of the people on this side the Atlantic, is generally true: the books of Howison and other authors may be perfectly relied on; I have not found them once wrong. Neither do I conceive it at all criminal to let you know all about them we possibly can. You will not, of course, believe the half of it: this is the way with you; but no matter, *it is truth* nevertheless, and will be found to be such by all who follow our paths, or have been in similar routes. And as to ‘stirring up animosity between nations,’ a thing that travellers are blamed for if they attempt to pourtray people properly, I hold it to be no sound doctrine; the nearer the truth they are drawn, the less bickering there will be in the matter. We cannot

bear to see the Scotch or Irish represented on the stage, unless the absolute manners in every respect be attended to:—it is the same with Jonathan; hit him fair, and he will by no means be offended. ‘He will guess as how we are pretty considerably damned clever, that we get along slick, and by the jumping Jesus, are not to be made wheelbarrows of.’ I therefore say, let us not slacken our exertions; let our attention be frequently turned to the Americans; let us believe more about them than we have done, as our travellers tell the truth. They certainly have acquired singular manners and customs in a short time, comparatively speaking, and make use of expressions that are perfectly destitute of wit and humour, but grafted on the roots of blasphemy and blackguardism; and this language gains ground. The genuine English is vanishing from the land. One of their members of Congress, a long time ago, proposed an act for doing away with it, which was then laughed at; but now it is going into effect, without being passed or enforced—a voluntary act of the people. In the course of a century, the English will not understand the twentieth part that will be spoken here.

“You may think that the British books in circulation amongst them will preserve the lan-

guage:—no such thing. Few of these are now read, and fewer will be, unless our writers condescend to please them by vile compositions in slang diction. But do not imagine that, because they despise your books, they do the same with their own: the press teems with newspapers, pamphlets, and tracts, which are greedily devoured, written in that kind of strain that pleases them, making use, of course, of all those words and phrases they are accustomed to. Even in their colleges this is attended to;—the voice of the people in a Republic is sure to be heard. Nothing like solid learning is known; the arts and sciences are skimmed. Men of common sense and shrewdness arise among them occasionally; but these, you know, are never indebted for their sense to scholastic knowledge. Any thing that smacks of delicacy of taste, refinement of feeling, &c. is utterly despised. Whatever deals in generalisms, whatever seems sanctified grossness, is sure to go well down. All threats, invitations, advices, orders, &c. are whistled at; to dictate to Jonathan how he should *get along*, is certainly presumption. 'Hey, Jem, cocktail won't hurt; damn all, let's have a phogmatic.' With such exclamations will they *clear out* from the sanctums of the Solons.

"Peace be with you!"

"DEAR SIR,

"THE Americans are no great guzzlers, or wine-bibbers. They hurry in to the dinner-tables at the sound of a bell in the hotels:—you would laugh to see them bustle about at this important period, every one carving for himself:—but no sooner have they done eating, than they *bolt*; that is, leave the table as quick as they came to it. Fifteen minutes is about the average time they consume at their dinners. There is little conversation going on while employed in this business; it is in the bars, and on the side benches out of doors, where dialogues are held. Our people from home here have a saying amongst them, 'That they take at dinner what no Yankee does.' At first, we think this to be some pudding or other; but on a short consideration we find it to be what I have been speaking of,—namely, *time*. I have often found that watch-note of use to me while travelling amongst them,—'help yourself.' Although this will not be told you by any Yankee, still you must act accordingly. On coming to one of their taverns, it is in vain to ask for any thing to eat or drink;—if you get an answer at all, (but most likely you will get none,) it will be quite evasive and inconclusive. Look *spry*, as they say, and walk through the bar and pantry, as

if at home, and if you can find any thing to eat or drink, as you probably may, then snap it up, and you will be thought the more of for so doing. They may guess as how you are an almighty odd sort of a man; but no matter for that. You must take no heed of what you get to eat, or drink, or where is to be your bed; 'sufficient for the day is the evil thereof.' If they guess that you are *mighty particular*, conclude yourself no favourite. They seem to pay but little attention to health, and look wasted and sickly; they drink vast quantities of *bitters* and other deleterious mixtures. When sick, they listen to every quack who offers an opinion, and, after all, take their own; they are often troubled with a kind of dysentery, for which they swallow *burnt-brandy* and pepper. They seem to have no great stamina, yet they can endure hardships well, for they can put up with any thing, and will not murmur although they should receive the harshest treatment. They have no idea of comfort. They have a national set of features; I could point out brother Jonathan any where; he has a countenance of his own, on which apathy and indifference are strongly marked. The eyes never roll wildly, he seems never in a phrenzy; the ebullitions of a warm heart are never to be heard; his enthusiasm is of a cool determined

cast. This pervades all ranks; it is *this* that we have to dread in the event of a war. He is not a strong man, but a crafty intrepid fellow; he will be upsides with us either by fair play or foul, so there is nothing like keeping a sharp look-out. It is true, that they care nothing about discipline; and why should they, when every one of them understands the cause they are engaged in? Our soldiers look to their officers to lead them on, and give the needful directions: it is all one to them whether it be the French or Turks they are engaged with, or what is the aim: they are there to fight and will fight. But Jonathan leads on *himself*; his brethren are all alive to the same cause; he is not to be beaten, or disheartened, for a trifle.

“Ever your’s,” &c.

It has been said, that owing to the small rise of the tides on the coast of America compared with that of Britain, which never exceeds ten or twelve feet, they can have no dry or graving-docks, wherein the large ships of their navy may be repaired, in case they require it at any time: a circumstance very likely. But let us not console ourselves with this idea; for they may have as many *repairing docks* as they please. There is

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scarcely any of their harbours that have not considerable streams of fresh water flowing down the country into them. One of these, suppose it to be of the very smallest class, will answer the purpose required; it will fill a *graving-dock*, if it has nothing else to do, in a very short time, and into this dock the largest ship may be lifted by means of a lock, the dock so contrived as to make part of the lock; only one gate and a sluice will be required to bring in the water, confine it, and let it out again, when the ship may stand high and dry in the dock; when repaired, it may be filled, and the vessel floated back to the ocean again. I think it perfectly proper thus to expose the real strength of this Republic wherever I consider it to lurk, that my dear countrymen may make any use of it they please; for although, in this instance, I have pointed out something that the Americans may not have conceived, still, whenever they require docks of the kind, they are sure to have them: so, whether I inform them or not, it is a thing of trivial consequence; let us, if possible, look round us and beware.

If bees be fed with sugar, they invariably get lazy and indolent, and will not visit their native flowers for a draught of sweet independence—this is the state of the Canadians. The British Govern-

ment makes drones of them:—is it not obvious? Look at the Americans, placed only on the opposite side of a river from them, with land not so fertile, taxed too, more remote from market, in every respect worse situated; and yet they thrive much more than the others. Indeed, when matters are rightly sounded to the bottom, we find that it is the United States we are assisting, instead of Canada; but probably this may be all for the best. Britain will never be injured, methinks, by the prosperity of any country, whether that is hostile or friendly, so long as she keeps empress of the ocean. Let Jonathan's internal resources be unchecked, let him and his brood swarm into Canada, yes, to the pole if they will,—it will ever be a distinct territory of itself; and if we manage matters properly, it will always be friendly with, and of the greatest consequence to us. But watch him on the ocean; let him be snubbed there; fear not his wrath.

If we laugh at Jonathan for guessing and telling *stretchers*, he profits largely by this kind of fun; and as long as we remain such a nation of doubters as we are, his gains will increase, while we may console ourselves with being considerable losers. We seldom give implicit faith to the narrative of any common traveller: we doubt some

part or other of his statements ; we suspect we see a little cloud rising out of the sea, no larger, perhaps, than a man's hand, which soon spreads, and often involves important truths in mysterious gloom. During the late wars in Canada, we sent out lots of water-butts to the ships on the lakes, because we would not believe but that they were arms of the sea, and consequently must be salt-water. It is this *doubting* of ours that has lost for us so much of the territories of America. We willingly enter into treaties with people who know it well, not wishing to expose our ignorance ; and, indeed, we have as much cause to know it as they ; and well we might, even much better than the Americans, for we have at all times been greater travellers than they, though we refuse to profit by our own labours. Every person cannot be expected to wander abroad and examine into the nature of foreign countries ; so, because we all cannot see, we will not *all* believe, and so we lose ourselves.

Jonathan is no such doubter : he takes our travellers at their word, and acts accordingly ; he "guesses" they are right. It is we who give him the chief part of his information : he receives it, indeed, without thanking us, and adds it greedily to his general stock ; while we reject the things

which are our own, and give them away without regret. What we consider to be lies, he receives as profound truths; and should they even be as we suppose, he is induced to make enquiries, and obtains a considerable accession of knowledge. He is an astrologer and astronomer at the same time; he will swallow any nonsense, but digest it afterwards. When looking out at sea for snakes twenty miles long, he not unfrequently sees water-spouts, and other phenomena, which would escape his notice, were it not for the serpents that haunt his mind. When we scout at his power, his untrained army and untried navy, he affects to dislike our sneers. But this is not the case in reality; he loves them, because he sees that we are inclined to under-rate his exertions, and therefore it would not be policy to contradict us; it is best to let us remain in our ignorance, if we seem willing to be so. What we make a boast of, he will never say much about, particularly if he imagine that he may receive injury by doing so. On those subjects where he keeps comparatively silent, he has the greatest cause to boast. Let his navy, then, and his steam-boat science, be marked; for these we have yet to meet, depend upon that. Let us not deceive ourselves respecting them, for they exhibit strength, and will probably be the greatest of

the kind we have ever had to encounter. I sincerely wish this were not so, from my heart ; but am afraid, that our harsh treatment to naval officers and sailors, who bled for us, and who are now heard growling against us in every part of the world we can turn to, together with the destructive dry-rot, will tell against our best exertions. Let us look to the encouragement of our veterans, our men of talent, in defiance of all private interest. There are few in Britain who will complain of the taxation which is necessary to uphold the glory of the navy.

It is to be regretted that our official travellers, most in whom we seem to place confidence, are selected either from the army or navy ; those who have a real genius for the business are overlooked. The French manage business of this kind much better ; they select theirs out of scientific societies, the resort of those who are famed for learning, enterprise, and general knowledge.

A person properly qualified will generally succeed much better by himself than with a host of others ; but we, fearful of being deceived, always send out large parties, that may act as so many *checks* on one another. The Americans, as a people, have many weak sides, which, by paying minute attention to them, we may discover.

They are certainly plotters ; yet we could outplot them, were we to study the art as much as they. For instance, were we to tell them a manifest lot of lies respecting some concern, and they to believe them, as *they would*, were we not to contradict them ourselves, we might lead them some pretty dances ; but our honesty and honour restrain us from this. We pride ourselves in being considered trustworthy by foreigners, yet we dare hardly *trust* ourselves.

They are, in short, a race possessing so much indifference and apathy, that it is of no use how you dress, or how you speak, or whether you are a lord or a raftsmen. They value you for nothing that you can possibly acquire. Were you covered with gold to the heels, had you the genius of Milton or Newton, it would be all the same thing : they have not much envy. Their enterprise is great ; there is nothing they conceive too hard to be done ; they are very ambitious, but by no means inventive ; they are good copyists, and can sometimes make new appliances and improvements. They are not very cowardly, nor are they easily thrown off their guard ; they can die without much growling. They have not keen feelings, and as for affection and friendship, they are nearly strangers to them ; neither do they bear great hatred, nor do

they study revenge. They boast a good deal, more than enough. They are not extremely honest, yet not to be generally blamed for dishonesty. They have no great love for war nor money, but are particularly anxious for large farms, states, and territories. They are not religious, neither are they very vicious; they are not luxurious nor voluptuous; they are not learned, neither are they extremely ignorant. Their passions are not fiery, nor furious; ever aiming after what neither they themselves nor their great-grandchildren will ever, probably, obtain; prophesying wonderful things, and expecting huge alterations to take place.

When there is any thing of a dark and doubtful nature, the Yankee is sure at once to explain it, and to assume all the merit of it. Thus he positively claims the invention of steam-boats as being his own; whereas Miller, of Dalswinton, is the undoubted author; and these boats were first plied in Miller's fish-pond, which is near the town of Dumfries; afterwards in the Clyde, where Fulton first saw them, and took the invention over to America:—these facts have been often authenticated. So long as the celebrated Walter Scott (I hate to put *Sir* to his name, for that does it injury) did not come forward and pub-

licly claim the Waverley Novels, Jonathan did it for him; and had the great poet been taken out of this world before he acknowledged himself their author, he would have stuck to his impious claim. Names stamped on inventions he greatly detests. When Wilkie, the plough-maker, not the *painter*, first sent his iron ploughs out to the United States, with his name engraved in legible letters on the principal casting, a Scotchman in New York remarked, that "the ploughman had *done* them for once; they would not rub his name in a hurry off the moulboard."

CURIOSITIES IN NATURAL HISTORY.

Snakes.

BLACKWATER snakes are common in lakes which have their shallow shores flagged with horizontal beds of limestone. They are very much like eels, from two to five feet in length. They move swiftly along the bottom on being alarmed, and when they have got to what they suppose to be a respectable distance from danger, they fling their tails into a spiral, and pop their heads above water. The Canadians will hunt them in their canoes, and on coming near them will cut off their heads by striking at them with their paddles. They do not seem to relish deep cold water, but where it is not above three inches deep and tepid, they lay their eggs, about the size of schoolboys' marbles, of a yellow dirty colour, about one inch and a half in diameter : the ova is

not shielded in a shell, as those of birds, but in a very thick tough skin, covered with minute tubercles. Doubtless, the warm situation in which they are deposited is the means of hatching the young snakes. They seem to be perfectly harmless; at least, the Canadians have no dread of them: were they otherwise, my friends would certainly fly from them sooner than any people, as they will sport with nothing of a dangerous and mischievous nature.

The Avrill, or Wood Worm.

Resting myself, one excessively warm day, on a projecting block of moor-stone rock on the shore of the Rideau Lake, I took a large clam shell that was lying beside me bleaching in the sun, and pitched it into the pellucid waters. My eye followed it as it sunk in zig-zag fashion to the bottom, which seemed to be about twenty feet down; but on trying it with our sounding apparatus, it astonished me to find the depth forty-two feet. How much deeper the eye could have pursued the object, there is no saying, as it seemed to increase in size the deeper it went. While pondering on this matter, one of our Canadian party brought me a large black worm out of the wood in the hollow of his hand,—the same I had

often seen before, but never having had leisure to examine him minutely, I now set about that very important matter. He was four inches and a quarter long, one quarter of an inch in thickness; had sixteen legs on each side of his belly, making in all, thirty-two; the body was of one thickness from end to end. The tail and head were rounded in the same manner, only in the head there seemed to be a mouth, wimble-shaped,—no doubt set round with cutting edges, if a microscope were brought to assist the vision, as it can bore holes into trees that are in a certain state of decay as neatly as any gimlet; hence its French name of *avrill*. On minute examination we also found, that it had eight vertebræ or divisions, with four legs to each. The trees which this singular animal seems to admire, are those which have been deprived of their bark by age; it crawls into them first at some crack, or at a hole from which a knot has fallen out; for be it known, that when a tree gets shrunk from the want of sap, the knots being of a hard nature, do not shrink so much, but generally either drop out, and leave a hole behind them, or a vacant space partly round between them and the tree:—the reverse being the case when it is young and growing; the knots are then formed by being acted upon by the pressure of

timber that keeps swelling about them. Once in, this strange worm keeps boring holes to the outer rind, and through it; for although the tree has no bark, a hard casement incloses the rotten interior. Now this would seem to be done for the purpose of introducing moisture, and promoting the decomposition; as Nature seems as anxious to encourage decay as growth, and this certainly does it. A capillary action is brought about by these worms, and moisture conducted through the tree; were no holes made, the casement alluded to would remain for many years, being rendered almost as hard as stone by the dry weather and heat of the sun. This worm and the woodpecker are never at work on the *same* tree: the season for the bird is before the bark *falls* off, which it greatly promotes; that of the worm, after.

The movements of this worm are not very quick; when laid down on the warm horizontal rock, it travelled about at a yard in a minute. One of the Canadians, unknown to me, took it up and threw it a little way into the lake, where the water was about ten feet deep. This rather displeased me: the poor fellow seeing this, was as sorry as myself; so we went down on the lower ledge of the rock, and what was to me extremely curious, we beheld the avrill crawling slowly on

the bottom beneath the deep water. In about five minutes time it reached the bottom of the rock, and continued very slowly to clamber up to the surface, in doing which it seemed to have great difficulty, and was frequently about to relinquish its hold, and fall again to the bottom. Had the lake at this time been the least agitated, it would not have succeeded in ascending the face of the rock. At length it came out very much exhausted, having been beneath the water about twenty minutes. How it can live in such a situation so long, I leave it to anatomists to judge; and how it knew the way direct towards the shore, instead of steering its course farther out, is also a mystery. It must have seen the rock rising up from the water; or the small declivity of the beach might have given it some information as to this. I am thus minute, for worms and their ways are things not sufficiently attended to by us, although they get our bodies to themselves at last. The manner in which they work out their holes is very curious; the borings are passed beneath the belly, in a hollow between the rows of legs. These, being strong, move about the dust of the rotten wood. The hollow is not unlike the groove of a gimlet. In Plymouth Sound there is a marine worm, about three-quarters of an inch thick, and about the same

length as the avrill, which bores holes through the limestone rocks in the bottom of the sound, where the salt-water is from forty to twenty feet deep. I have seen many of these stones so bored, and when inspecting the bottom with a diving-bell for a good foundation to a sea-wall that was about to be erected, we found acres of it bored as with a wimble, to a considerable depth; even many of the limestone blocks that compose the Breakwater in the Sound are bored like a sieve, and actually devoured by this worm. It succeeds in making these holes by putting a quantity of sand before its head, when it works away like a marble-cutter, making a circular aperture. It may not be proper, perhaps, to say, that this worm will gnaw the Breakwater so that the damages may take some cash to repair: this work keeps sinking every year, perhaps it may be mainly attributed to that cause.

Thus do we see very insignificant animals perform wonders. The interminable forests of America are cleared of their dead timber by a worm that grinds its hard particles, when the friability of the substance absorbs moisture, and decomposition rapidly ensues. We observe the bottom of the ocean changed in a strange manner, and the hard rocks reduced to powder; the sand, in due time,

after shifting about from one coast to another, becomes consolidated again somewhere else, by meeting with minerals of a plastic composition. In short, look where we will, the constant transition of Nature is sufficiently obvious.

Carriion Crows.

These birds are very common in Canada, but the rook is not to be seen; it could not live through the snows of winter: yet there are rookeries in the southern States of America. When nearly in the middle of the Atlantic, returning to England, the ship was visited by a couple of carrion crows. After flying round the vessel several times, one of them dared to alight on the maintop-gallant-mast; it seemed very much exhausted, and flung its extended wings around the ropes. When one of the sailors went up the rigging to catch it, no symptoms of fear were observed about the bird; it calmly submitted to be taken alive. When brought below to the deck, it refused both fresh mutton and biscuit, and even would not take a drink of fresh water, which induced the sailors to remark, that it was not his *grog-time* yet. Poor fellow! he had not come to his senses properly. When taken into the cabin of the half-deck, he speedily recovered; so we

brought him home to Old England. As a carrion crow, he is a very beautiful one, plump, sleek, and glossy of plumage. After securing this one, its partner came hovering round, and alighted on the ship also; but he disdained to be caught. Perhaps it was the male bird. He preferred plunging into the surge and drowning himself, to a cabin-passage along with his mate,—perhaps at free board. These crows must have been on the wing a long time, as there was no land nearer the ship at the time than the Azores Islands, and these must have been more than 400 miles distant. It is probable that they might have lost their reckoning, by taking a voyage on the wreck of some ship that was floating about the shores:—who knew whether attracted by a barrel of beef, or perchance the corpse of some of our poor fellow-creatures!

Black Wild Ducks.

These ducks are nearly as large as geese, and make excellent roasting birds. While coming home over the ocean, one of them continued to follow the ship the greater part of a day: it would come up on wing almost to the cabin windows; and had any fowling-pieces been on board, it would certainly have lost its life for its audacity. It had evidently gone adrift, as the sailors term

it; that is, lost the flock it belonged to; and was driven out to perish in the deep, as there is no food for such birds far in the Atlantic. When the ducks quacked in the ship's coops, it seemed to delight in the sound, and quacked in reply: how anxious did the poor bird seem to enjoy the sweets of society again! this is the more remarkable, as wild-ducks are very timid birds. In Canada, duck-hunting is carried on as largely as in England; but were the people to form decoys, such as those in the Fens of Lincolnshire, or make use of the swivel-armed raft, the quantity that might be procured would surely be greater.

The Camerons were the best hunters I ever knew in Canada. They were brothers, of Highland extract, hardy fellows, and extremely fearless: they would go out a deer-hunting, and sometimes bring home fifteen in a couple of days; and as for shooting ducks, they were unmatched, and filled the canoe with large fat fowls when nobody else could get a shot: they would go out on a morning and procure four and five dozen with ease. The black wood duck is the best of all the wild-duck tribe: it is of a sooty colour, with a dirty yellow speckled breast, and nearly as large as a goose. They feed on the wild rice, which grows plentifully in the small streams in the remote woods:

they are not met with in large flocks: many of them remain during summer, and are met with large broods following after them.

One of the Camerons having observed a large flock of wild geese on the Lake of the Chaudiere, used every means in his power to have a shot at them, but could not: he crawled round the rushy banks, from one point to another, but it would not do, still the flock kept aloof, and vexed him with their shyness. At length he took his canoe, and having cautiously got into it, allowed himself to drift out into the Big Bay towards his prey; and when he had got, as he considered, within shot, he let fly, and, dreadful to relate, the canoe upset from the percussion of the musket, and launched the keen sportsman into the deep. This, however, did not concern him much; instead of clinging to the canoe, or even catching a paddle, as many others would, he quietly swam ashore, without saying a word, with the *gun* in his hand, a distance nearly of a mile. His brothers on the bank did not seem at all alarmed: they got out on a point, and rode a tree to the canoe; that is, took a branch of some one or other that had tumbled down—these are always in superabundance—sat on it as we would on a saddle, and paddled away in the water to the canoe, which having

uprighted, they easily succeeded, with the aid of the branch, in embarking by the stern, when away they hunted the wounded wild-geese, and brought a good shot ashore, where, on arriving, they found their brother had prepared a fire, was drying his clothes, and broiling something to eat. This is an instance of the advantage friends derive from "working into one another's hands." Wild ducks may be scared from one end of a lake, or from one bay of a river to another, but it is no easy matter to frighten them out of a lake or river entirely: so the sportsmen take their stations, and keep the flocks in exercise,—that is, when they fly to one end or corner, they are graciously saluted by a volley, and when the remainder return, they are greeted in like manner, until consultations in loud quacks announce that they mean to make themselves *scarce*, by visiting distant waters, where the thunder of the hunter is not heard.

When the buds begin to come on the trees, the pigeons arrive in immense clouds from the southern regions of America. Some of these clouds I have seen seemingly above five acres in extent. They move with great rapidity, not in strings or any regular kind of figures, as waterfowl do, but in irregular clouds; those before are often flung behind, while they warp and veer round one ano-

ther. The shooters plant themselves on rising ground, and bring them down in great plenty, as they fly over them. They are not near so large as the wood-pigeons of England, but of the same colour, and have longer tails; they seem to live in the wilderness, on the buds of various hardwood trees, as the contents of their crops affirm. Those skilful in pigeons say, that they are frequently shot in Canada with the rice of Mexico in their stomachs, inferring from this, that they can easily go two thousand miles, or so, for a dinner, without being fatigued. They breed together in the woods by millions, and the singular noise they make in their crowded nursery, or matrimonial haunt, surpasses any sound I have ever heard—it is a loud and confused buzz of love.

LACHINE, GRANVILLE, AND THE PETITE NATION
CANALS.

THE Canal of Lachine was the first thing of the kind constructed in Canada; it began in 1821, and was completed three years afterwards. The civil engineer was Mr. Burnett, a gentleman of great practical experience in such works, more particularly in heavy masonry, sent out from Britain by the celebrated Mr. Telford. This work does Mr. B. the greatest credit; its construction is equal in merit to any canal in the world; and such work being quite new in that country, he found great trouble in getting it done thus well. His anxiety brought on a disorder that carried him off before he had the pleasure of seeing his work completed. His son was with us at the Rideau, a young man of natural strong talents; but the swampy wilderness was too much for his constitution,—he died of a lingering disease, and left us all in tears. This

canal begins at Montreal, and extends up the side of the Island of Montreal for nine miles, until it gets to the still-water at the head of the Rapids of Lachine. It is twenty-eight feet wide at bottom, forty-eight at the water-line, slopes generally two to one, has five feet depth of water, and a towing path. The whole fall is forty-two feet; it has six locks, and two elegant stone-bridges. Much of the cutting was through rock, pretty deep. It cost, when completed, about 115,000*l*. which was defrayed by a spirited company of merchants, while the Provincial and Imperial Governments assisted. It does, during the season, much business, and will soon leave the shareholders a handsome per-centage yearly; it is frozen up about four months in winter.

The Canal of Granville was begun some time after Lachine, but it is not yet above one-half completed. It is about forty miles from Lachine, at the Rapids called Long-Sault and Chute of Blundo, Ottawa River. It is of the same magnitude as the above in almost every respect. The expense is all defrayed by the Imperial Government. I have often thought that a dam might have been raised across the Ottawa, beneath the rapids, and the rock-cutting have been thus partly avoided.

Between these canals, a steam-boat lock has been built by Mr. Drummond, of dry stone, on a new principle, which answers well; and as it gives him the command of this part of the navigation with his steam-boat, it is to be hoped he will be fully rewarded for his enterprise.

It is somewhat curious to remark, that in the estuaries of rivers, and at the head of rapids, there are always islands. In the first case, these are formed by the whirling eddies of contending currents: the larger the rivers, the more extensive the islands. In the last case, their formation arises from quite a different cause; the bottoms of rivers near to rapids being uneven, owing to water being spread over a large surface, which still keeps trending away to the narrow outlet by numerous winding ripples, which, in time, get deeper, while the bumps below approach nearer and nearer the surface. In due course of time, as these sinuous streams and the great rapids themselves grind away their channels, the protuberances of the bottom come above the water, and become islands. These continue to enlarge for a certain length of time, so long as the waters surrounding them do not make a very quick descent; but when this takes place, decay comes on, though unseen, and gradually wears them down, until they find their situation

on the brink of the rapid, when they are undermined, and conveyed in pieces down the rumbling cataract. Thus, by a curious process of Nature, the islands in rivers change situations.

People have generally fancied that, the distance being only about sixty miles, the Petite Nation River would be the best route for a canal, if it were intended to connect the St. Lawrence and Ottawa. The fall was reported to be trifling; and the source, near the above large river, where, by a short cut, plenty of water for supply might be obtained. But, considering the matter, I found the fall to be 156 feet; distance of cutting, eleven miles, through rocky gravel, and averaging twenty feet deep, in order to bring in the St. Lawrence, at St. Johnstone's, to the Black Creek source of the Petite Nation River;—and these were no trifles to encounter. Moreover, St. Johnstone's is about fifty miles from Lake Ontario, along the States' frontier, which was to be avoided.

Casual travellers, passing through a chain of Canadian rivers and lakes, conceive that, as they meet with plenty of water on all sides, and smooth sheets deeply gliding for many miles, the whole could easily be converted into an *extensive inland navigation* at a very *small* expense. Would they examine the *rapids* with care, and

not the *still sheets*, the truth would be guessed much nearer. But these are not looked at, as the canoes in which they travel have to be carried past them, and this part of the journey travelled on foot by a path through the woods, so that the rapids are not seen in many instances at all. Would they, in *making the portages*, as this business is termed, examine the rapids, and obtain something near the number of feet of fall they have, and then say 1500*l.* is about the expense of every *foot-lift* of a good commercial canal, they would pretty nearly hit the estimate. There are always, too, a host of interested persons making assertions by no means to be depended on. We must see with our own eyes, feel with our own hands, and tramp with our own feet, before we can hunt out any thing near the truth; and this is but as it should be: it gives a certain class of beings something to do, and obliges them to do it.

LUMBERMEN.

LUMBERMEN are persons who procure logs of timber, deals, planks, spars, staves, &c. in the forest, and bring them down the wild lakes and rivers to market. The term 'lumber' is quite applicable; for what are these wooden wares but lumber? In winter they *make it* on the remote banks of small streams; and when these swell with the spring freshets, it is floated into the larger, of which they are branches, where there is never any scarcity of water, and where they can have no dread of being detained for the season. Often the thaw is such, that the small rivers do not rise; the consequence is, that the lumber must remain, in hopes that the next spring will be more favourable. This is a misfortune, however, to those in the trade; at least, with those who have it in such a situation. Those who can get it to

market, however, obtain a better price for the commodity. The tributary streams of the Ottawa, or Grand River, such as the Madawaska, Bonchere, and Calumie, are those where the *lumberman's* operations are, at present, the most extensive in Canada. They will average about 700 miles from Quebec.

Lumbermen and *Shantymen* are nearly synonymous; with this difference, that the former are generally the masters, or, what the Canadians call, the *Bourgeois* of the latter. The *Shantymen* live in hordes of from thirty to forty together; throughout the day they cut down the pine trees, and square them in the *pineries*, or the oaks in the groves, and afterwards draw the logs to what is termed the *bank*, with oxen. When spring draws on, they form the lumber into small rafts, called *cribs*, and drop away down the rapids to market. When they come to any extensive sheets of still-water, the cribs are brought into one grand flotilla; masts, white flags, and sails are sported; while, with long rude oars, they contrive to glide slowly along. Thus they will come from Lake Alumet, on the Ottawa, to Wolfe's Cove, Quebec, a distance of nearly 800 miles, in about six weeks. On these rafts they have a fire for cooking, burning on a sandy hearth; and

places to sleep in, formed of broad stripes of bark, resembling the half of a cylinder, the arch about four feet high, and in length about eight. To these *beds*, or *lairs*, *trams* or handles are attached, so that they can be moved about from *crib* to *crib*, or from crib to the shore, as circumstances render it necessary. When they are passing a *breaking-up rapid*, they live ashore in these lairs, until the raft is *new withed*, and fixed on the still-water below.

As these people live in huts in the woods, as stated, which huts are houses only for a season, they are called *shanties*, and hence, *shantymen*; but there is something more attached to the name *shanty* than mere *hut*, in the lumberman's dictionary. Thus, so many men, oxen, so much pork, flour, &c. compose a *shanty*. A *beehive*, with him, is not one, unless it be stocked with bees, combs, honey, &c. In these shanties they pass the time pretty well, considering them to be made up of Highlandmen, Irishmen, and Yankees. Great quantities of spurious whisky are swallowed, many battles fought, and so forth; yet these things being perfectly natural to the shantyman, he could hardly endure life without them. In the conceited towns he is held in abhorrence by the *clerk* and *counter-jumper*, who know no more of

the laws of Nature, or the elements of human life, than a parcel of magpies. They fancy that the wood-cutter from the wilderness should be made up of nods and smiles, starch and ruffles, like their dear affected selves, never thinking that he is a creature by himself, like the sailor, bred amid dangers and difficulties, and made somewhat roguish by the sharking rogues of the cities. For the *storekeepers* cram their stuffs into their shanties, almost whether the poor fellows will or no, giving long credit; and if they do not get three times the value for them, they *decoy* the lumberman, who probably had himself nearly drowned in the rapids, and his raft spread about in all directions, the chief part never to be obtained again.

The truth is, that the lumberman can do very well without the *storekeeper*, but the latter not without the former; so the man of intrusion decoys the man of real business. The lumberman, with all his roughness of manner, is the person who does good to the country. He brings an article to market with much risk—the only staple commodity, in fact, that is; and, consequently, he is the means of bringing the greater portion of cash to Canada. What is the *storekeeper* but a person living on his exertions,—a person that might be

dispensed with? He is the *rogue*, not the lumberman. His intent is to have *three values* for goods, which, were they not forced on the poor woodsman, he would not take. He thus contrives to get him into what he calls his *debt*, although in common justice he is no such thing, and then abuses him for being so; although, to get a *lumberman in debt*, is the drift of the storekeeper, as there he keeps his victim, feeds, clothes, kicks, and tantalizes him to madness, making him a character far worse than he otherwise would be. Let this matter be better considered than it has been—let the saddle be put on the back of the right horse. The lumberman has a rough beard, a wild countenance, is in the habit of using uncouth language, and performing many ugly actions, certainly; but there is the sleek-shaven *storekeeper*, mild as a lamb, and tame as a dove, uttering delicious phrases, and, nevertheless, behaving abominably. Crafty old fellows! but we see through them. The poor lumbermen and shantymen are not properly represented; we have the tales of the cities respecting them, and these are false. To know them, we must visit their wigwams afar in the depth of the forest; we must live with them for a time, and partake of all their joys and sorrows; we must run the rapids with them, and get well wet with

spray and sweat alternately: then begin to judge of the character. But to hear it attempted to be developed over a counter by a smart-looking fellow with a quill behind his ear, is all humbug and falsehood. The greatest care and attention ought to be paid to the lumberman in Canada; without him, what is she? His rights ought to be better considered; and lawyers mistake themselves much on this very subject.

At Quebec, there are people called *Cullers*, who are appointed to select lots of timber according to quality. The refuse wood is called *culls*, and brings an inferior price. There is a good deal of corruption and bribery going on in this business, and many *rafts* of timber get a worse character than they deserve. The honest English captains of ships are the best *cullers*, in my opinion; and our merchants at home would be acting wisely, if they allowed them to select their own cargoes, instead of their agents there.

Nearly two-thirds of all the timber that comes to market is the *white pine*, which generally brings five-pence currency per cubic foot at Quebec, red pine eight-pence, and oak ten-pence. A duty of one penny per foot is paid for it by the timber-merchant, as it passes the Falls of Chaudiere, on the Ottawa. This cash is meant to be

expended on the improvements of the rapids, that the rafts may pass them without breaking up; and about 2000*l.* has already been expended for this purpose at the Chaudiere, in building dams and deepening channels; but it is a difficult matter for science to improve a *chute*. When the water is deep enough to run rafts down, the turbulence of it, thundering against the sides, and rebounding in a frightful ridge towards the centre, breaks up the rafts. A fall of 31 feet in 200 yards is a pretty steep inclined plane. I have thought that, if its bottom had been blasted out to something approaching the *logarithmic curve*, steep above, and taking the lake below nearly in a line, this might be found to answer, as we found it to do where the waters reeling down the chute *struck* the *smooth sheet* below, so that the rafts were knocked asunder. Being called on to give my distinct opinion respecting this business, I proposed to abandon the *chute* entirely, and build two rough strong *stone-locks* in an adjoining *gully*, where every kind of material lay at hand, and the situation was very favourable:—this is meant to be adopted.

The scene of passing rafts down the *Big Kettle* is one of the most beautiful we can look at. The lumbermen cautiously proceed from off

Rafting Bay, above the falls, with the *raft*, to which a boat is attached. When they have pushed sufficiently out, and come between a small island and the Great Cauldron, where the *suction* or draught begins, they hurry into the boat, and make for the island, leaving the raft to its fate. Away it comes, and when descending into the *Big Kettle*, it generally makes a *somerset* in magnificent style, and spreads amid the foam, every log swimming by itself. Sometimes the raftsmen will venture too far, and in the hurry to get into the boat, are caught by the descending ripple: nothing for them then but to fly into the rock which stands at the head of the falls; and when there, it is a business of great difficulty to bring them off to the main-land. Three men had almost died of hunger before this could be effected: at length the *log* thrown drifted to the rock, to which a rope was fastened; they got upon it, stride-legs, having bound themselves by the rope, and so were dragged through the waterfall, on the brink of the Kettle, to the shore, by their anxious friends.

The lumbermen have also to pay so much per hundred cubic feet to the Provincial Government, or to those to whom the land is located whereon they obtained their timber; so the *lumber* is not had for nothing, as some are led to conceive.

Sticks, or *pin*es suitable for making masts of, are rare, and not to be found in the forest but by very intelligent lumbermen; nor can they be got out of the woods to the rivers without a great deal of trouble: 50% is the common price of a good pine, such as a main-mast may be made of answerable for a ship of 800 tons burthen.

CHARACTER OF THE CANADIANS, AND THEIR
BOAT-SONGS.

TRAVELLERS have all been pleased with these people, and so have I, to a great degree. They are kind, tender-hearted, very social, no way very ambitious nor industrious, rarely speculative. The French blood freely circulates through their veins, nor will they leave any of their old habits. How proud they are when they see us adopting any of their customs. If we can speak their language but indifferently, they are sure to help us out with the words, and will never *laugh* at our blunders. The girls are, many of them, very good-looking, their faces oval-shaped, of fair olive complexion, while, as the Poet sings,

“ Their glossy locks to shame might bring
The plumage of the raven’s wing.”

None of them are very tall, or yet slender ; they are amorous, but never presumptive or disgust-

ting ; generally, they enjoy good health, but seldom have very large families ; they rarely wrinkle before three-score years have passed over them, and, quite unlike the American ladies, they keep their *teeth* entire to the last : this is, because they live according to the laws of Nature, the former do not. In winter, they neither wrap themselves up from the cold so much, nor, in summer, strip for the heat, as the former ; they love to run barefoot in the country during summer, and wade in the waters ; even the young peasant boys are to be seen jumping about amongst the snows, without any covering on their feet. They commonly marry young, and almost never with any other than their own people ; they make affectionate wives ; and old couples are to be seen as fond of one another as the young. In the country, they make their own simple clothes, and purchase as few luxuries out of the shops as possible. Sugar they obtain from the Bush, and also *Indian tea*. The young ladies, however, are at times fond of little trimmings for bonnets, yet they never make any foolish display of ribbons, rings, beads, or ear-rings. Their ideas of sense and simplicity are just ; they have abundance of fine feelings, and few fierce passions ; very little calculation, and generally seem to have a large share of contentment. They keep their houses very warm

in winter, and are seldom without plenty to eat and drink. Some of them, however, on barren lands, are not very well off; for this they have to blame their own industry,—they will not improve their land by manuring it: however, they are frequently compelled by the urgent calls of hunger to do so. They make very good tradesmen, and monopolise the *stone-cutting* business. The wooden houses they build are very strong and substantial. When we go into any of their houses, they very kindly salute us; if the men or boys have on their hats or caps, they instantly doff them, while the girls curtsy: chairs are quickly ranged round the fire, if the weather is cold, and you are invited to rest yourself; if the sun is hot out of doors, milk and spring-water are produced: they seem to know our very wishes; we have no need to speak, only that they like to hear us speaking,—and who would not gratify them? If hungry, bacon and eggs are soon set a broiling; if fatigued, a bed is made ready; if seeking for fun, the fiddle is uncased, and we all fall a dancing. How different from the treatment we meet with from Jonathan! Should we lose our way through the woods, a common thing, the boys run out, glad to conduct us: to be sure, they like to get a few *coppers*, but this is not the main motive

to the action; it is their very nature to oblige, their disposition is kindness. The Canadian has no plots, he cannot intrigue; it is perfectly easy to see the drift, if a little duplicity be meant;—he makes a wretched rogue—the most pitiable scoundrel; he dare not steal above a dollar, at most; beyond this, the idea would crush him. During summer, they sit in large parties beneath the verandas of their houses, and enjoy their pipes and the cool breeze, while the endless chat is kept up, and we wonder what they have got to say, as so little pausing takes place.

Fun, as Burns says, seems to be their *cronnie dear*; with their dogs, sleighs, fiddles, and canoes, they pass through life very merrily. When they meet each other in their sleighs on the *snow roads*, they will not steer much aside; an upset in a deep *wreath* is a source of great enjoyment. For some years, the Americans coming from the States with their *notions* to the Montreal great mart, were in the habit of running the Canadians off the road, their lumber-sleighs being much heavier. This did by no means please Jean Baptiste, my hero: he took his sleighs to the forge, and got a hoop of strong iron round them at the point of concussion; and one day, being apprised of a huge caravan of Yankees coming across the St. Law-

rence from Laprairie, the Canadians took to their iron-bound sleighs to meet them. Off at the full gallop they started, hurraing, and made a famous charge on the enemy, broke and upset their laden lumber-sleighs, wheeling pork, flour, eggs, and *frozen hogs* into the snow. How the whips did crack ! Jonathan yielded, growling ; he could do nothing else ; and never after that did he dare to abuse the Canadians on the roads, but divided the path with them pleasantly. They have *bells* on their horse-harness, which add to the jangling confusion, and help greatly to cheer up their snowy exploits.

They make very good soldiers, yet, in times of peace, are greatly astonished with any symptom of *war's alarms*. At an electioneering business in Montreal, an immense mob of them assembled : a friend of mine loaded a double-barrelled horse-pistol, and plunged in amongst them, firing off the shots in the air, at the same time uttering a hideous yell, when the greatest bustle took place about 'who should be home first : ' in an instant the streets were cleared. What a difference between this and an *Edinburgh mob* ! Shots may make *them* cling closer together, but will not disperse them. Coming once past a village called the *Grand Brulee*, Mr. Mackay and one of them had an altercation

about a luggage-bearing business, when the whole village turned out, as if they would devour us at once; but Mac, knowing their nature, lifted up the *porter*, and gave him a *shake or two* before them, when the whole crowd quietly retired. Mr. Burnett used to keep a *portable gallows* in his pocket, with the *effigy* of a person *hanging* from it. When they displeased him at any time, and would not work as directed, he would display the terrific engine, when they instantly reformed their ways.

As *voyageurs*, or ramblers of any kind, they find much delight, so that a number of them be together. They will endure privations with great patience; will live on peas and Indian corn for years together. They are seldom troubled with melancholy; suicides are very rare amongst them; and madmen and lunatics as much so. They are good at composing easy, extemporaneous songs, somewhat smutty, but never intolerant. Many of their *canoe-songs* are exquisite; more particularly the *air* they give them. Could I do justice to such, a few should be inserted here; for I have all their *good boat-songs*, and mean to publish them with the music attached, without which they are useless. Indeed, let me do my best with them, it will be impossible to inspire those who have never

heard them sing, with much emotion. We must be in a canoe with a dozen hearty paddlers, the lake pure, the weather fine, and the rapids past, before their influence can be powerfully felt. Music and song I have revelled in all my days, and must own, that the *chanson de voyageur* has delighted me above all others, excepting those of Scotland.

Our military bands in Canada pay much attention to these *airs*, a thing which charms the Canadians. In cases of war, they will be doubly valuable; although none of them are of a martial nature, they will nevertheless serve to rouse some of the noblest faculties of the mind. I may here give one of them: the poetry is trivial, but when sung in full chorus, as stated, it has an exhilarating effect.

PETITE JEUNETTON.

Quand j'étois chez mon père—*bis*
 Petite Jeunetton, Dondaine et don,
 Petite Jeunetton,
 Dondaine.

M'envoye à la fontaine—*bis*
 Pour remplir mon cruchon. Dondaine, &c.

La fontaine est profonde—*bis*
 Je suis coulée au fond, Dondaine, &c.

Par ici il y passe—*bis*
 Trois cavaliers barons, Dondaine, &c.

Que donneriez-vous, belle—*bis*
 Qui vous tirois du fond ? Dondaine, &c.
 Tirez, tirez, dit-elle—*bis*
 Après cela nous verrons, Dondaine, &c.
 Quand la belle fut tirée—*bis*
 S'en va à la maison, Dondaine, &c.
 S'asseoit sur la fenêtre—*bis*
 Composer une chanson, Dondaine, &c.
 Ce n'est pas cela, belle—*bis*
 Que nous vous demandons, Dondaine, &c.
 Votre petit cœur engagé—*bis*
 Savoir si nous l'aurons, Dondaine, &c.
 Mon petit cœur engagé—*bis*
 N'est point pour des barons, Dondaine, &c.
 C'est pour un homme de guerre—*bis*
 Qui a de la barbe au menton,
 Dondaine et don,
 Qui a de la barbe au menton,
 Dondaine.

The translation may run as follows.

When *Jeunetton* was a little girl at her father's,
 she was sent to the fountain to fill her little pitcher ;
 it was deep, and she fell to the bottom : when
 there passed by three titled knights. " What
 will you give, my beauty, to him who draws you
 out ?" said one of them. " Draw ! draw !" she
 replied, " and after that we shall see." When

they had drawn her out, they went together home, and she sat down in the window to write a song. "It is not that we ask of you, sweet love," quoth they; "it is to know if your little heart's engaged."—"It is engaged," she replied; "it is not for the knights—it is for a *warrior* who has a *beard* like a *goat*."

The zest of this seems to be, "that warriors are the favourites of the fair, and that *truth* lies at the bottom of a *draw-well*."

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PROPHECIES AND DIALOGUES OF JONATHAN.

HATH not the day come when that which was foretold by Congress is come to pass? True were thy words, O Benjamin Franklin! and the speeches which came out of the mouth of General Washington were clothed with wisdom. We are become the great and the mighty nation, and our arms are but yet stretching out. We feel our strength waxing daily; our bones are filling with marrow. Have we not kept off our foes? have we not beaten them? They came forth with their heavy black ships, and their well-dressed armies; the coats of their soldiers were without a rend, and the buttons, well-gilt, did sparkle in the beams of the sun;— but we battered their hulks out of our channels; we tore off the garments of their troops; with our rifles did we riddle them; they will mind

Bunker's Hill, and Saratoga they have not forgot. We shall drink from the herb of tea, and our families for ever, but the tax shall not be paid. We will go forth to the coasts of Orient with our own barks, and we shall lade them there, sayeth Congress. We have gone over the Eastern seas, and we have done accordingly.

THAN.
The days were, when *keep what we had* was the watch-note of the brave; now it is, *take what we please*. We have long passed the towering hills of the Alleghany, and have spread our domains from the ocean of the East even to the great Pacific of the West. Behold Kentucky now! let the heart be charmed with the glories of Indiana! Look at the wheat waving in the country of Genesee, at the cities and villages growing in grandeur: they come forth in a day, and will last for ever. Great are we, and ten times greater we will be! Few are the years gone by since Europe made us a laughing-stock; but she will yet bend the knee before us, and supplicate the help of the powerful. The sea shall be ours, sayeth Congress, and every ship that sails therein; they will yet have to implore a port for shelter, and permission to pull up the anchor;—but we will be liberal, we will let the voice of freedom be heard—meanness is not for our breasts. Let the low idea have no harbour

there—ours are the noble doings of enterprise and excellency.

The land beyond the great lakes is ours ; look on it as such, for it is nothing else. The treasures of haughty England may build her forts, may run her canals : she doeth us good, yea, a great good thereby, sayeth Congress. The land of Canada is ours, and every tree therein. The time draws nigh, when a *stick* shall not be taken across the Atlantic—no oak then for Old England ! We will give them a tree now and then for pity's sake ; yea, we will furnish her with a navy, if she will pay us for it—we will build her ships of high rate—we will give unto them three decks or four—we will fill them with sailors, and cannons, and shot : they may launch forth—we will meet them—down shall they sink, sayeth Congress. We have sunk them before, and may guess we will do it again. Ours are gallant seamen ; we feed them with manna, clothe them with silk and cotton : when in harbour, they are ashore with their dears ; thither they come from all nations.

The scholars fill our colleges now ; yea, the men of great learning and profound reflection. What is Shakspeare to us ? and as for Milton, let not his name be heard : the genius of poetry is here—where else could it be ? Is not poetry the musical

language of Nature? and here it is for the mere sitting down. Here are the waterfalls and woods, the rivers and mighty lakes: in reality they are before us, far beyond what fancy could furnish, or the eyes that have never seen convey to the mind. And here, too, the artists:—look to our *steamers*, now they swarm on the noble sheets of inland water! If the ocean is yet to be ruled by *steam*, what a nursery here for our sailors! sayeth Congress; and much greater we will be. England to us is a mere mussel-reef. We are between Asia and Europe; the one on our right, the other on our left. The Pole is our northern boundary; and the Canal of the Isthmus of Darien shall be dug, and for a time may become our Southern bourne!

Dialogue between John Bull and Jonathan.

JOHN BULL.—It seems to me, son Jonathan, that you are grown excessively greedy of late: I have been blamed for having an appetite myself, but nothing to yours: if you had all the earth, it is my opinion, you would long to have the moon too. This is something like one of our Dukes, who was ever asking his King for some favour or other; when the monarch replied, that if he gave him the three Kingdoms, he would wish to have the Isle of Man also, to cure herrings on.

JONATHAN.—Ay, ay, father Bull; but I should not term ye *father*, for the rough treatment you gave me when young. You attempted to crush me then, but could not; now I am got strong, in spite of your disposition, and will treat you as I think proper. You may say revenge is a *mean thing*, and all that, but your revenge has been ten times worse than mine. What did ye burn *Washington* for, ye old rogue? Here 's at ye like a stranger, as the Irishman said, not like a *father* at ail.

J. B.—That was more an accident than any thing else, and should be hushed up and forgotten. I certainly never meant to hold the blazing faggot to the capital of the States; while, you know, I have allowed you to fish on the Banks of Newfoundland for that little blunder, and given you many things else.

JON.—Given! yes! nothing but what you could not help! Forget such accidents! the thing is very likely, when the *infernal story* is in our popular *school-book*! Let it be read there; let it be mingled with the teaching of youth. May the young mind suck it in, and hate you for ever! What was a barrel of *cod-fish* to archives of valuable *records*? You burnt up the *deeds* of our lands; you consumed our *charters*; you

broke down our civil laws, and disordered our internal policy; threw private property into confusion, set the *lawyers* abroad amongst us, and ruined thousands of honest, worthy men. Can the peasant forget you?—the tea-tax was nothing to this!

J. B.—Be cool, Jonathan; thy disposition is to calculate, and really thou shouldst not get into a passion, for thou knowest I can burn Washington again and again, and not allow thee to pluck up one codfish: and I dare say it would be good for me to do so, seeing that thou art so ambitious and headstrong, but I will consider the matter a little. Nevertheless, do not wrap thyself up in the idea that I will not *do it*, for whenever I find thee troublesome amongst my colonies, and abusing my mercantile trade, a few ships will be sent out to set thy boasted *sea-board* a-flame; New York shall be laid in ashes, and your representatives roasted in the House of Congress!

JON.—You are perfectly welcome to come any day you can find it convenient; you will find me at my post, with a handsome fleet to receive ye,—your Nile and Trafalgar will be nothing to the meeting. Come on; I shall hunt you over the Atlantic. My steam-boats will ruin your Plymouths and Portsmouths, and send Liverpool and London

to the devil ! Can you stop us ? I defy ye ! What is a battery of cannon to quick-moving steamers in a dusky evening ? Pass them right away, and consume ye. Stay at home, if you are wise ; if you come out, depend on a drubbing.

J. B.—Why, really, Jonathan, you grow mightily in conceit, and in pride you wax great. The fact is, that I'll bid the Canadians *lick* ye whenever I find ye troublesome : they will give you tit for tat, my chap. They broiled your bacon at Lundy-lane for the roasting you gave them at Plattsburg ; they will be upsides with ye, never fear. They have roads and canals now to get up their strength to the Lakes ; so where are ye ? You may shut up your sea-board ; clap on the tariff when you will ; my goods go up to the Lakes, and there are your smugglers to receive them.

JON.—Just so, talk away ! Canada ! all fudge. Roads and canals ! what are they ? what's our *Lockport* ? why, a pound of gunpowder would ruin the New York Canal. Canada ! we will not hurt a hair of its head ; no, no, it is a drain for your odd dollars ; you fling them carelessly into it ; so much the better for me ; they all float into the State ; were there not such a place on our continent, we could not catch them so well. I might

easily extend my territories to the Pole, but won't think of that. You must have a decoy, old fool.

J. B.—So, my lad, you hate me yet, yea, as you do truth itself. You were ever bad, and will never improve. The ways of thy wickedness crave my attention; they deserve my reprobation and disgust. Thou art, in thine own language, *progressing* to the Devil.

CELEBRATED ORIGINAL CHARACTERS.

THE chief of these is *Philemon Wright, Esq. of Hull*, a Bostonian, who came to Canada about thirty-six years ago with 30,000 dollars. Rum-maging through the country in quest of land, he came upon the Ottawa River, and proceeded up it to the *Falls of Chaudiere*, in a canoe. "There," says the *Squire*, "I clambered up a tree, and on looking round, found myself at the head of the navigation: there I saw a number of rivers, as it were, pouring into one: the country, by the appearance of the timber, seemed fit for agriculture. 'Here shall I take up my abode,' I exclaimed, 'for this will become a place of vast importance in due time, although it is now nothing but a howling wilderness.'" Being pleased thus far, he hastened back to Quebec, and took out his *deeds*, invited some of his people to follow him,

came back up the river 100 miles from any neighbours, and there commenced operations in earnest, levelled down the forest, built houses, raised large crops of grain, and bred many cattle, pigs, and poultry. In a short time, he had more than a thousand acres cleared, and the township swarming with people. The Indians could not understand this: they became alarmed lest their whole territory should be taken from them; but Mr. Wright quieted their fears, gave them tobacco, and granted them many indulgencies. Struggling on for about fifteen years, he found himself as wealthy a man as any in the whole country. He kept an extensive store, and supplied the traders with timber and fur, of which they stood in need; he also put up a saw and grist-mill; and numerous were the wares he conducted down the river to Quebec. Had all the people who have gone to Canada as much genuine *enterprise* as Philemon, the country would have presented a different appearance to-day from what it does. He soon became well-known far and near; improved the breed of his cattle; became a great favourite at the court of his Governors, and colonel of his own regiment of militia; sent his son *Ruggles* to England and France, to observe the manners and improvements of Europe—a trip that cost the old



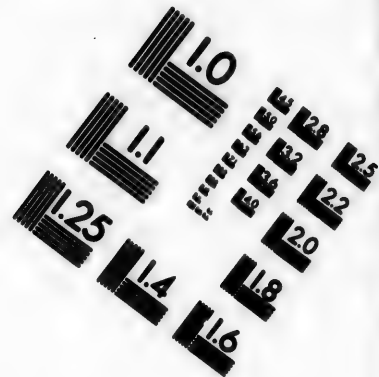
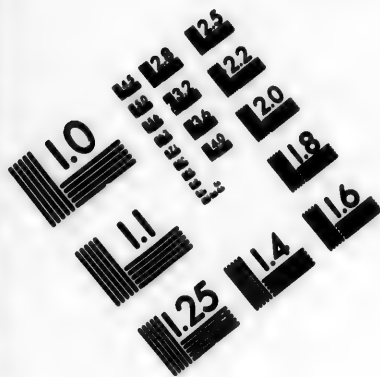
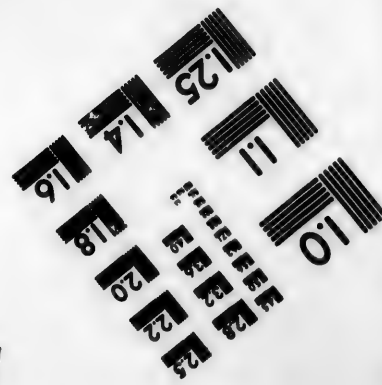
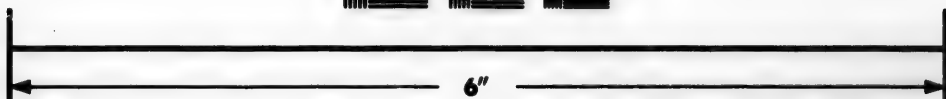
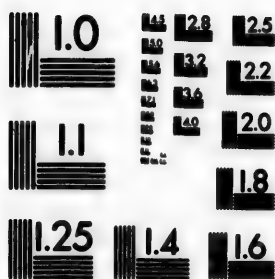


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gentleman something to the tune of 3000*l.*, but that he grudged not. How contented was he when his son returned, with a beautiful *bull*, and a *he-goat*, of the most renowned ancestors !

The township of Hull now became a fashionable resort ; a splendid hotel was built ; livery stables were well stalled ; a steam-boat set a-going ; flag-staff and bell erected : while a magazine was filled with gunpowder ; and an armoury richly filled with cannons, muskets, and swords. The howling wilderness vanished ; the bears and wolves sought more remote regions. But this was not all, nor the half of all ; churches, and chapels, and schools were built ; and priests, surgeons, school-masters, and lawyers, were frequently to be met with at Hull. *Free-masonry* also flourished : the *squire* was a *Royal Arch-mason* ; procured a charter ; opened a lodge in high style ; while all the men of character about flocked in, and became members of the ancient craft. He was a perfect Jacob, and yet is truly an *American* ; but a loyal man to *Hull*—and that is quite enough. He has also a kind heart ; and will differ with none, unless an infringement be attempted on his lands. He is about six feet high ; a tight man, with a wonderfully strange, quick, reflective, wild eye. No one is more the father of his people than he ; when he has

been from home at any time, on his coming back guns are fired, bells rung, and flags waved. He is now about seventy years of age, but quite healthy, and can undergo any fatigue; the most severe cold is nothing to him, and as for the heat, he minds it as little. All his enjoyments are of a singular kind; there is some domesticity about him, but not much. Talk of schemes of the wildest enterprise, and he is then in his glory; and if he can get any one to meet his views, how happy he is! It was he who first proposed the *Rideau Canal*; and I have heard him, with pleasure, propose many other works equally great and ingenious. Mr. Galt amused the people of Quebec, by producing him on the stage, in the character of *Obadiah Quincy, Bunker*, from Boston: the worthy old gentleman used to sit in the *box*, and laugh heartily at himself.

Captain Andrew Wilson, R.N.

This gentleman is one of the most notable *factotums* to be met with in Canada. He is at once a *profound lawyer*, with all the acts of the provincial legislatures on the top of his tongue, at a moment's warning; and at home, a *farmer of the first rate*—will talk you blind about raising bullocks, wheat, onions, what not; an *author too*—has pub-

lished in three volumes octavo a *naval history*, fraught with tactics and sea affairs. At his house on the banks of Rideau,—*Ossian Hall*, as he is pleased to term it,—there is the best library that ever was taken into the wilderness; books of all sorts; and a *vade-mecum* full of sea scenes, and drawings of ships in action and out of it, while the outline of many a headland, cape, and bay, is there pourtrayed: this *valuable* album he terms the *sailor's hornpipe*. Set the captain fully a-going, get him out to sea, some grog a-board, and how he dashes away! One would imagine, to hear him, that there never was a battle fought on the ocean but he had the pleasure of being in it. Thus will he speechify: “We had given the fellow chase for three days, d—n him; and on the morning of the third, a slight fog came on, so who could see him? One looked out from the top after another, but no signs of him. Up went I, glass slung at my back, and after looking out a full quarter of an hour, I bawled down to the men at the wheel, ‘I have him!—starboard—set the compass—off the weather-bow—mark the direction of the glass;’—in an instant round came the ship. ‘Yet I have her!’ I bawled down. ‘Steady, —all steady, Sir,’ was the reply; when I withdrew the glass, and went below. We bore up,

came in view, and in two hours we had him,—a Spanish prize worth ten thousand dollars. Captain Andrew Wilson *did that by the Lord!*—He was often with me in the woods. On engineering exploits the captain was an excellent rummager, and understood the nature of creeks and gullies well. Presenting him with a *map* of a part of the wilderness he was well acquainted with, “Yes, Sir,” he exclaimed, “it is the thing, Sir: there is *Otterson’s House* to an inch, Sir; you have marked the *Deer Lick*, Sir,—I know it well,—many a day I have been there with my gun, Sir. You have made your name *immortal* in the woods, Sir—or I’ll be d—d, Sir.”

There was a dam, however, which we were building, that did not please the Captain; and he used to reprobate it thus. “You are *no engineers*, I will tell you to your faces, gentlemen; where will ye be when the floods come fifteen feet at a start,—when the ice of the lakes gives way,—when the snows, trees, houses, and all the banks come before it?—where are ye, gentlemen?” Matters did not turn out just so ill, however, as he suspected they would. One time at the Hull hotel, I observed the Captain present at a party who were singing in full chorus a *Canadian boat-song*; the famous *Judge Macdonnel* was leading;

but our hero did not seem to enjoy the hilarity. The song was long, and he was mute: getting perfectly weary, he dashed down his wig on the table in great wrath, and burst forth with, "D—n your *fresh-water* nonsense; come out to the salt ocean, my boys, and I'm with ye!"

He is a *Justice of Peace*, and *Notary Public* too; signed not only R.N. to his name, but J.P. and N.P. Married many an amorous couple; although this is said to be against the law, if a clergyman be within fifteen miles: however, what cared the *noble captain*? "he had soul and body to look after; he had the county of Bathurst to govern; the Perth lawyers to regulate; the roads to lay out; and more to do than all Downing-street." However, his importance was not so great as he would have us believe; indeed, with those who really knew him, he seemed quite aware of this, and would good-naturedly laugh at his own nonsense. There was one thing he insisted on, but never could prove to me its correctness, that every *tree* in the forest, great and small, was worth a *dollar*. If such be the case, Canada is much more valuable than I am led to believe it is. He held his weekly courts at *By-town*, where the following *alarming* case, amongst others, came before him.

And really, to see the Captain on the bench, with his *anchor-button* coat, attending gravely to the examinations of witnesses, taking off his spectacles, occasionally wiping them, and then carefully laying them across his nose again, while the court of *ignorance* was marking his every motion,—the scene was highly ludicrous. Of this he was perfectly sensible, but it was an amusement to him; he liked to be *consulted*, to *make speeches*, to have his *pockets* crammed with *documents*, and all the world following him.

A couple of housewives becoming intimate, one of them made the other a *present* of a fine breeding hen. But *chucky*, not quite happy in her new abode, made her nest in a gentleman's hayloft, and commenced hatching there. During the period of incubation, she regularly returned to the home of her old mistress, and received her food. When the brood came forth, a dozen in number, the gentleman laid claim to them, as being part of his property; the woman to whom the hen was *presented*, also put in her claim; while the original owner, because she had *fed* her, considered she had the best right to the flock of any. In such an embarrassing case, the justice called up all his learning, and recalled all the statutes; when, after

considerable bickering, the woman to whom she was made a *present*, received her once more into her holy keeping.

To Dr. Dunlop, Warden of the woods and forests for the Canada Company, &c.

“WELL ! bless my life, Doctor, what earnest enquiries you make after *Mother Firth*. Now the fact is, she never, so far as I am aware, was a mother ; that is to say, she never had children. Yet she is a good *motherly* body for all that, and, indeed, has the *folk* of the Grand River under her holy charge. But I see what you would be at, so shall go a little into particulars. Her maiden name is *Dalmahoy*, and she was originally a milliner girl in Edinburgh. She still makes for the rummagers in these parts most beautiful black otter caps. She wandered, for some cause or other, to London ; and there a clerk in a sugar-warehouse, a young Yorkshire lad, of the name of Firth, fell deeply in love with her. They have told me this tale many a time themselves, with a degree of simplicity and warmth, which has much pleased me. Her mother having been married to a serjeant engaged in the wars of Canada, Miss D. started off from her dear lover, Isaac Firth, crossed the Atlantic, came up the wild Ottawa River to the Falls of Chaudiere,

and there on Point Nepean became a squatter of eminence. There her mother and her mother's husband (who by the way was her stepfather) built a log house, after they had burrowed in the snow for some time; and there they began to keep a house for refreshing the weary wet raftsmen, as they dabbled up and down the rivers: during which time our young woman was much courted by the beaux of the neighbourhood. A raftsman of my beloved acquaintance, a half-pay navy captain, ditto ditto, and some Americans from the famous township of Hull, struggled hard for the prize; but whilst the contest ran high, out came the London clerk, and Miss D., like a compassionate, good-hearted soul, clasped him to her bosom.

The log-hut on the Point now received an enlargement, and two or three small rooms were added. These were furnished in an elegant manner by the tasteful Mrs. Firth; so much so, that when the late much-lamented Duke of Richmond, Governor of Canada, came up the Ottawa River to establish his military townships, he was perfectly surprised to meet with such a neat furnished cabin in the heart of an endless wilderness. He stopped several days about the place, and examined the singular Falls of Chaudiere. He then went to Richmond, which was about twenty miles off; and

after having examined the state of his township, he was hastening back to Mrs. Firth, when that most dreadful of all diseases, hydrophobia, broke out on him. I have been at the place, Doctor, where this happened, on the small river Jocque, about five miles from the now *Clauchan of Richmond*. He was crossing this stream in a birch canoe, when the spasmodic affection first appeared, and was taken into a hut by the bank, where he died. I have been in the hut, and shed a tear to his memory.

"Alas, the poor Duke ! he did not return alive to Mrs. Firth's public-house, but his dead body was brought there by his attendants. Really, Doctor, she keeps a snug little inn, and has plenty of dogs and tom-cats, which I am sure would please you. We hold all our *big nights* here with much hilarity : our Halloweens, St. Andrew's, and so forth. She is all in all with the other Governors of Canada and their ladies,—the first woman, in fact, at court; and were I wishing to have interest in the country amongst big folk, there could none be found to equal hers :—you may, therefore, conclude with me, that this lady from Auld Reekie is no joke in the wilderness of Canada. She is governess, truly, whenever she pleases ; and should ever Walter Scott or you give a biographical account of eminent Scottish women, I hope neither of ye

will be so unmerciful, or so unjust, as to exclude from the valuable work the meritorious Miss Dalmahoy, alias Mother Firth.

"The Indians are allowed to retain all the islands in the *great rivers*; but this law is often broken through by settlers. In truth, they are often located on islands, and are not aware of the fact until the land is cleared; they are then, perhaps, astonished to meet with a channel, or *snie*, leaving the river above the rapids, winding far into the country, then returning to the river again beneath the falls. Squire Wright built his *town* on an island of this kind. Mrs. Firth squatted on one too, unknown to herself; and when she made the place famous, various people came forward, and began to claim the property according to their *location tickets*; but Point Nepean being an island, they could not molest her:—so far, good."

Chief Mac Nab.

This is a real chieftain from the Highlands of Scotland, domiciled in Canada, with a numerous clan about him. He received the grant of a whole *township* of good wild land on the banks of the *Lake de Chats*:—this is a beautiful place! Here stands the *castle of Mac Nab*, surrounded by the houses of his followers. He annually sells off his

estate an immense quantity of fine pine-timber ; and moves about through the provinces occasionally with his *tail*, dressed always in full *Highland costume*, the *piper* going before, playing perhaps the *Hacks o' Cromdale*, or the *Campbells are coming*. We were well acquainted ; and on my once addressing him *Mr. Mac Nab*, he checked me—"Sir, (said he) I thought you had known better : nothing but *Mac Nab*, if you please ; Mr. does not belong to me." I held myself corrected, and kindly thanked him, of course. Many emigrants come out to him every year ; some lovely *Highland girls* ; he meets them at Quebec, and escorts them up to the land of timber instead of *heather*. He is yet but a young man, very cheerful, and full of enthusiasm about Scotland : a thing rarely met with amongst people beyond the Atlantic.

Any person wishing to know the nature of the Indians, their manners, customs, language, &c. should apply to *Judge Macdonnel*, at *Point Fortune*. No man in Canada knows them and the French Canadians so well as he. For many years he was amongst them, and is yet to a certain degree. He means to favour me with his *notes*. This gentleman is brother to the celebrated *Miles*, now no more, who behaved so well in

the trying scenes which happened at *Red River* between contending fur-companies. For local information respecting men and things, there is no equal to my friend Theodore Davis; he knows every *concession line*, can put his hand on all sacred *post-marks*, lead you up all wild rivers, show you all mines and minerals, and explain to you the *lumber trade*. I have *his notes*. He lives near the Judge above mentioned; and I believe there are not two individuals on better terms in Canada: they will quarrel and be friends twenty times in one day. Fortune favoured me one frosty winter with a month of their company.

THE CANADIAN MISSISSIPI.

MASSAPI is the proper *Indian name* for this district, which signifies a small river falling into a large one. *Mississipi* means a large river falling into the great deep. Our Canadian river disembogues into the Ottawa at the rapids of *Chats*, about one hundred and fifty miles from Montreal, and thirty-five from *Bytown*. This is a most interesting stream, and so deserves a minute account. It rises out of large lakes behind Kingston. One of them is near the *Crow Lake*, where the famous Marmora iron-mines are situated; its highest lake is about 415 feet above the level of the ocean. The country round these lakes, as far as it has been explored, is of the richest quality of any I have met with in Canada. Settlers thrive about them, and on every waterfall there is a mill. On one of these, called the Norway Falls, is to be

met *Sawny Sneddon's mill*, very ingeniously constructed, and the water let upon it by a tunnel through a clay bank. Mr. Bolton, the miller, gave me much information respecting business in this quarter, with rude sketches of the lakes, for which he has my best thanks. The flourishing settlement of Lanark is here; and it was in this part of Upper Canada where Peter Robinson, Esq. made his experiment with Irish emigrants: which did not very well succeed, his people, as all from Erin are, being so difficult to manage, so disposed to riot.

The most beautiful bridge in the world may, some day or other, be built over the great river Ottawa, at the rapids of Chats; here it is about one mile broad, rushing down between fifteen islands, nearly equidistant from one another, each of which will form a pier for the future noble bridge. At this place is the settlement of Mr. Sherriff,—a lovely place! One branch of the Mississippi falls into the Ottawa above these rapids; the other below, forming a large island between of 2500 acres. On this island a town is proposed to be built. This river might be made navigable at no great expense, were the portages *locked* with *dry-stone locks*, the stone laid on edge and well puddled behind. This seems to be the sort

of lock most suitable for the country, as they may be constructed for much less than those built of ashler: the table limestone is common, and answers for this kind of work so well. The navigation of the river might be much more easily opened than the making of suitable roads: to form these in a woody country is a very difficult thing; and, as the high trees seclude the wind, they are seldom so dry as to be passable. Were this river *locked*, it would open up an immensely large fertile country, more than all the emigrants from England would require these ten years; while a connexion by Cockburn Creek, and the Rideau Canal, would be soon effected. The entrance to this great navigation would be Fitzroy Harbour, then up the Channel of Dingwall and Mac Millan, blending together the great Lakes of Chaudiere and Chata with the rich Mississippi. My excellent friend Mr. Quinn, the surveyor, kindly sent me the following very valuable letters, which confirm my own observations.

"Amesbrook, the 5th January, 1826.

"SIR,

"AGREEABLY to promise, I beg leave to transmit to you the following description of all I am able to state on the subject of the several falls and rapids

on the River Mississippi, from its confluence with the Ottawa to the Mississippi Lake, in the township of Beckwith,—not taken by rule, but by estimation, which I state from my long knowing the place, and from many times and at different seasons traversing the same in a bark canoe, and which I hope, on future investigation, will be found near the truth, having been taken with care at low water. First, The rapids below Hubble's Falls commence about a mile and a quarter from the Ottawa: about 20 chains long will give a fall in perpendicular descent of about 12 feet; the great chute, about 8; then at about 10 chains up stream, north-west of the island, about 4, making in the whole about 24 feet. Then comes smooth gliding water, about 18 feet deep, running at the rate of about half a mile in the hour for the distance of 7 miles, to Mr. Harvey's mills: first fall, or mill-site, from 11 to 13 feet; then at about 15 chains distance, a fall over the second dam, about 8 feet: the whole may be supposed at about 24 feet, including the fall of the swift water between both dams, of about 3 feet. Then follow about 6½ miles of a gliding river, nearly the same as already described, to the Norway Falls, on which Mr. Sneddon's mill stands. The canoeing ride, in the north-east branch, will

admit of a fall of about 6 feet from the foot of the rapid to the mill-place, which is in distance about 8 chains; the mill-fall I suppose is 14 feet; making in the whole 20 feet. Flat water immediately commences at the mill, and continues for about 2 miles to the foot of Brown or M'Quin's Rapids, which are about three-quarters of a mile long, of very swift water, without breaking its surface until within a few chains of the foot of the rapid, where the water changes colour and breaks, and would, I suppose, admit of a fall of about 16 feet. Then about 2 miles farther of flat running water commences. The first of Mr. Shipman's Falls, on the north branch of the river, falls perpendicular; on the south side it runs rapid, with no such fall, and would form a descent of about 20 feet. Then it continues, for a distance of about 12 chains, up to the foot of the grist-mill, about 4 feet; then the mill-fall, about 14 feet; then very little fall for about 6 chains up the stream to the saw-mill, which is rather taken out of the side of the river to a natural hollow; then a fall;—but I will suppose the whole together at that part would be about from 40 to 42 feet. Then there is a flat rapid river for about 4 miles to the foot of Appletree Falls: the main chute thereof I will suppose at 12 feet of a

fall; the rapid above it, about 6 feet; making in the whole 18 or 20 feet of a fall. Then Mr. Glendenning's Falls, about 4 miles up the stream, of no great magnitude, nor fit for any kind of machinery. Then, next and last, at about a distance of $1\frac{1}{2}$ miles, come Murphy's Falls, on which Mr. Bailey's and Mr. Bolton's mills stand: from the foot to the head, is about one mile in length, and will give a fall of about 40 feet. Then are about 12 miles of a lake to Friar's Falls, which are scarcely great enough for the mill thereon; and very little fall from that to the Mississippi Lake, in the township of Bathurst. Then, through the Sherbrooks, the river is mostly lost in lakes, and runs through a flat country, until the river divides into two branches;—the south branch thereof, I am informed, takes rise near the Bay of Quinty.

Should a more exact account be required, it would do me great honour to be your most humble servant in the execution of the work, which I trust you will find me well qualified for.

“ With due deference,

I am, Sir,

Most obediently yours,

(Signed)

ON. QUINN, D. S.

Or Deputy Surveyor Provincial.”

"Amesbrook, the 6th of March, 1828.

"YOUR favour of the 17th of January has only a few days since reached my hands; through what means its delay has been occasioned I am not able to discover. The approval of my former explanatory detail loads me with great acknowledgements to you. I now beg leave to proceed to state, on an abridged scale, all that I know of this section of the country, through which my professional capacity has from time to time called me; hoping, at the same time, you will perceive that I am not wilfully going to make a false report to our government, or any of its ministers. Under the latter, I presume, I may class *you*; and will first commence on the fertile banks of the Mississippi, from the Ottawa to Hubble's Falls, in the township of Fitzroy. About one mile and a half is low, marshy, and inundated for about half-a-mile from the mouth on the western shore; then the banks become prominent: soil not good for about half-a-mile back, then becomes more fertile, as you proceed, for a distance of about fifteen miles in a westerly course, but is not much inhabited: the northern shore rocky: on the banks of the river there is an island reserved here to the Crown, about 2500 acres, which is not land of first quality; it is very little known: it is bounded by the Chats Lake and

Falls on its north-west, by the Mississipi on its south-west, and by the Snie on which Mr. Dingwall's saw-mill stands, on the south-east. From thence to Harvey's mills, in the township of Pakenham, is a distance of six miles. On both sides of the river lies the best tract of land, for about four or five miles distance on each side, that I have seen in my travels, where a mare and foal let loose in the woods the first day of May, will come home *pork-fat* in December, from grazing on the *marlweed*, or horsepipes, with which it abounds : cows and oxen feed similarly : all here abounding with innumerable brooks and rivulets, (many of them of a saline nature,) all of which empty into the Mississipi. There is also the township of Huntly connected with the above tract ; about six miles from the river is its northern boundary ; and a well-settled, good township, in which rises the river Carp, which empties into the Ottawa below Fitzroy Harbour. Much timber is in the above tract ; a vast quantity of oak, maple, beech, and basswood ; large quantities of pine on the east side of Fitzroy, with very few swamps intervening. A great want is felt of stones for building, from Hubble's Falls to Harvey's mills ; none but what are obtained at these places. At Harvey's mills is the best of limestone. One hundred maple trees tapped

in April, with the attention of *one man*, for fifteen days, will make one hundred and twelve pounds of sugar, ten gallons of molasses, and one barrel of vinegar.

“ From Harvey’s Falls to Norway Falls, about six miles, rather more indifferent soil, with more stones and pine, but still very fit for cultivation, partly settled. About three miles above Harvey’s mills is the mouth of the Indian River, coming into the Mississippi: about one mile up there is a fall of about forty feet; it averages about one chain wide throughout its extent, and rises in the township of Lanark. About one mile above the Norway Falls, similar in size and source, is the Ramsay *Indian River*, on which stands Bellomie’s saw and grist-mill, about eight miles from its confluence with the Mississippi; then through the townships of Ramsay and Beckwith, for about twelve miles, to Murphy’s Falls, is a well-settled, productive country, particularly on the western shore. About one mile above Murphy’s Falls commences the Mississippi Lake, about twelve miles long, dividing the townships of Ramsay and Lanark on the north-west, and Beckwith and Drummond on the south-east. Close to the banks, the land is not generally good, but has several handsome settlements made thereon. Beckwith, on its south-

easterly shore, abounds with a shallow soil, and a flat rock of limestone underneath, with very much swamp, but, like Ramsay, closely settled. On the western shore its mines abound with *adamant ore*: I have known two side lines, run by the magnetic needle, to intersect each other from the force of attraction, until the surveyor had to establish an astronomical meridian to remedy the same. About ten miles from the head of the Beckwith Lake, is the Bathurst Mississippi Lake. I am not able to enter into distinct details on the subject of the waters higher up than the first lake extends; but can say, one lake is ten miles from the other. The river divides itself into several branches, each of considerable magnitude, falling into the stream, which Ben Bolton's mills in Bathurst are on. Capt. Playfair and Grunlies mills are all on the divided branches of the Mississippi. The country throughout abounds in mill-seats, and is excellently watered. The soil is of the very first quality either for tillage or pasture; the rivers and lakes breed many fish; and there are ores in the hills."

DISPUTES AND CRIMES.

DISPUTES of a very serious nature, and even murders, are not unfrequent. The French Canadian dislikes both the Irish and Yankees; his hatred seems rooted. "Sacre Bourgeois," he will swear at the former, because they wear breeches that bind at the knees, and *stockings*; and "Sacre Yankee Crapo," at the latter d—d Yankee toads. In the towns they have frequent broils, and the noise that the French make in battle is excessively loud. Jean Baptiste is by no means a boxer; his blows are very light: he makes "much cry and little wool," as the Devil said when he sheared his hogs; indeed he never can fight alone, he must always have a large flock of his countrymen about him before he dare strike a blow; and when requested to desist, or caught by the arms by one of his friends, how he foams and roars! Indeed one who knew him not, might be foolishly led to sup-

pose he would drive all before him, were he let loose. The Irish have frequent *rows*, and carry the spirit of party with them wherever they go; the *orange* and *ribbon-men* have often dreadful rencounters. A man was murdered in one of these riots on the banks of the Ottawa; a fellow knocked him on the head with the knotty root of a tree, and stove in his skull. The poor man died in an instant; the murderer fled away above sixty miles, was pursued, caught, brought to trial, and acquitted. The saying is, that "it takes great interest to hang a man in Canada," which is, indeed, true. Another was killed at a raft beside where I was stopping at Point Nepean. He had been fighting on the shore, and pursued his foe into the water, who got upon a raft of timber, and struck him with a paddle on the head. The man fell in two-feet water, dead. No investigation took place: a kind of sham coroner's inquest, by a few drunkards, was held; the murdered person was buried, and there was no more said about the matter.

Colonel By, myself, and some others, were travelling in the wilderness in the month of December 1827; the weather was bitter cold. Having got into a considerable clearing, we bore away for a large house of an American settler.

On getting in, we found all the rooms on the ground floor crammed full of people of all descriptions: such an ugly, suspicious, dirty-looking set I had never before seen. The *back-slums* of Holborn, London, where villains and vagabonds congregate, never were honoured with such a crew. By the language and general appearance, I found the majority to be of the landlord's nation; the others were poor wandering Irish emigrants. With some trouble I got through the crowd, and had my frozen feet and hands partly brought round at the fire. Potato whisky and pipes of tobacco seemed in request, and were served out by a *bar-maid* of such exquisite beauty as Hottentot hath never yet beheld. Not having rested our bones for a long time, fatigue began to overcome us, but there was no place to lie down on: as for *beds*, such machines were always perfectly out of the question. A plank, partly clean, was all that ever could be expected in such houses, and indeed over all the semi-civilized part of the country; but in this there was not *room* to stretch on the floor:—we might have space for the vertical, but not for the horizontal position. Wearied out, the Colonel asked me if I could by any means learn if there were any apartments up-stairs. With some trouble the

landlord was discovered. This is a difficult thing in an American *free and easy*, as the host appears so much a guest, that it requires some nice discrimination to find him: however, I succeeded, and having put the question, "he guessed there was considerable of room; that I might surmount and see; and if we would kipple up by threes or fours, he had buffaloes would kiver us." Accordingly, the Colonel, and a few of our party, went up a narrow, frail, dirty staircase; I was afraid of the steps giving way. We then entered a large room, exceedingly cold, round the sides of which a number of weary mortals were stretched. The candle I carried would scarcely burn; for there were many windows in the room, and few panes of glass in any of them, so that the frosty wind poured in cold and strong. While looking round, and muttering to one another, "This won't do, we shall be frozen to death here," we observed something laid upon an old table, and covered with something by way of a sheet. What was this? On removing the same, and holding forth the glimmering candle, we saw the dead body of a young man, seemingly about fifteen years of age. One side of his head seemed to be mangled in a shocking manner, and covered with clotted blood. "No; this place, indeed, will not do," we all agreed, and

down stairs we went. On coming below, we found the greater part of the company had "cleared out," as they say. Venturing to make some inquiries about the dead lad, we met with nothing but evasive answers,—as much as to say, it might be better for us all to keep a "caum sough," alias, make no noise about it. However, I found this to be impossible; and although some of our party sunk down in sleep on the floor, where melted snow, brought in by the travellers' feet, had flooded, some of us hung on by the wall by the sides of the fire.

In the course of our distant inquiries, we found that the greater part of the guests had gone to the barn and the stable, there to kennel up amongst hay;—that the dead body up-stairs was that of a young Irishman, who had been killed two days before by a shot from a gun, carelessly let off by one of the sons of the landlord. In the morning, the father and mother of the lad came crying after us in great tribulation, wishing us to interfere, and bring, what they called, the "murderer of their dear child" to justice; but this was a thing to us impossible, unless by engaging in an affair we had nothing to do with; and, after having done our best, the *laws* of the country would not probably have been exercised then, as we had often seen. To

account for all the *whys* and *wherefores*, is what I am not able to do. I have stated some cases, and given the results: this is all that can reasonably be expected from an humble traveller. There is something faulty in the administration of the criminal laws, no doubt; but energy and exertion lie dormant in Canada; humanity begins to be neither much felt nor talked about. Where no encouragement is held out to virtue and talent, the noble spirit of man begins to droop, and Vice to show her ugly visage.

BURLINGTON BAY AND FORTY-MILE CREEK.

THIS is one of the most beautiful bays in all Canada, and also one of great importance. It is situated at the head of Lake Ontario, is about 12,000 acres in surface, shaped somewhat like an equilateral triangle, and is from thirty to forty feet deep. The country encircling this bay is uncommonly fertile; the settlers are chiefly Dutch. The orchards are of great extent; apple and pear trees loaded to the ground in the proper season. Burlington and Montreal vie with one another in fruit. I was called here by the Provincial Government of Upper Canada, to examine a small cut that had often been attempted to be made through the beach between the bay and the lake, but could never be effected properly, although nearly 10,000*l.* had been expended on it. This beach forms, as it were, the base to the triangle, and is about six miles long,

composed of the finest grey drift sand. It is about 180 yards wide, curved concave to both bay and lake. This bay being shaped out by Nature to become part of Lake Ontario, the waters which gather into it from the adjoining country, rushing out, meet with those of the lake, frequently driven by a strong north-easterly wind, so that a commotion and deposition of mud and drift-sand take place, which has formed, in the course of time, and yet continues to add to Burlington Beach. Were there less water coming out of the bay, or stronger winds on the lake, the beach would not be in the situation it now is; being exactly where the balance of power takes place between the contending causes. A cut through this beach to admit schooners which navigate the lake, had long been attempted, as it is said; but the fine drift-sand continued to choke it up as soon as it was excavated. A dredging machine had long been at work, but could not keep the channel clear to the depth of ten feet, as required. Piles were extremely difficult to drive, the sand being very compact beneath water, although of a shifting nature. No stone was near the place; and the piers of the cut, or artificial channel, were formed with *cribs of wood*, filled with *pebbles*; but, after these had been laid down, the fine drift-sand ran out from beneath

them, and so they were undermined, while it flowed through beneath, and filled up the channel's mouth towards the lake. A breakwater had been built, in hopes of preventing this; but it went the way of the piers, and did no good. Under those perplexing circumstances, I humbly proposed the following plan: That in the absence of stone, *wooden cribs*, filled with *pebbles*, were good, but they ought not to have a *bottom*; if they inclosed the pebbles on the *sides*, that seemed the only thing wanted;—for where the storms of the lake had broken the *cribs*, and floated the wood which composed them out of the way, the fine sand was unable to find its way through the *pebble wall*. That this wall would answer well without timber inclosures, or *wailing*, but only, if such were used, fewer *pebbles* would be required to construct the piers; and as they were rather expensive to be obtained, it was advisable to make use of timber inclosures. If the latter failed to confine the pebbles and spread, let more pebbles, or muffin stones, be added. It was easy to see that, the cribs being bottomed with *cross-bars*, these formed apertures for the drift-sand to get through into the channel. The north-east line formed the angle of storm, when the wind had the full sweep of the lake: therefore the pier, to oppose the

storm, must be three times stronger than the other, and must have a *return-head*, as in England, that the fine sand coming before the storm, may be washed past the mouth of the channel, and spread on the beach, when the wind sweeps from one end of the lake to the other. It is called the *ocean-wind*, as it prevails on the ocean at the same time: this is a curious circumstance, the reason of which I was unable to fathom. These winds prevail in the spring and fall. Storms on the lakes are not so tempestuous as on the ocean; the waves are *short jumping seas*, as the sailors term them, and will undermine walls built within their influence, and ultimately upturn them sooner than will those of the ocean. The short swells run easily into eddies, and filter fine sand through orifices with great rapidity. That the undulations of the lakes are different from those of the ocean is obvious, from old sailors, and people long accustomed to the deep, getting sea-sick upon them. Surmising thus much, the piers ought to be flanked with water-soaked oak,—there was plenty of this in the adjoining forests,—which (oak) ought to be laid along in horizontal ranges; or if it were wished to make a better job, let them be laid on their ends by one another's side, on the vertical slope of the stormy side of the pier, and

thickly round the pier-head. In building seawalls in America, where stone cannot be obtained, this water-soaked timber seems to be an excellent substitute, as it is very heavy, and, when sunk beneath water, may last for ages. As to excavating the channel by means of the dredging machine, it seemed it might be more easily done without it, if the operations of Nature were properly attended to; for the truth was, that when a north-east storm came on, the waters rushed through the cut into the bay at a velocity often between six and seven miles an hour, forming a tide in the bay, and raising the waters round its shores, flooding *Coot's Paradise* above, almost up to the town of Dundas; so that, when the storm abated, the pent-up waters returned to the lake with a similar velocity. Let advantage be taken of this to scour out the channel through the beach; let the fine sand be stirred when the current is flowing out, and that will certainly make it deep enough in a very short time, and preserve it so, without the aid of any dredging machine whatever. These hints have been somewhat attended to, I believe, and the channel is now kept free; while there is not a finer harbour than Burlington in the world. *Burlington Heights*, at the head of the bay, are almost of *impregnable strength* by Nature; during

last war, a *Block-house* and military-store were roughly built on them of timber. These *Heights* are a narrow neck of high land, about 250 feet above the level of the waters in the bay, which wash one of its sides for about two miles, while the great swamp of Coot's Paradise ranges along the other, about 100 yards broad, where it joins the main-land. Ships drawing 20 feet of water may come in beneath the *Heights*; and *Grindstone Creek*, just beside them, may be very easily converted into a beautiful dock for repairing them: a stream of water comes down it, which might fill a *lock* to lift them out of the waters of the bay into the stocks. This lock, with its small wing-walls, would also effect a most desirable object; it would back up deep water over the unhealthy pest-hole of Coot's Paradise, so that ships might go up to the town of *Dundas*, which will yet be one of the largest towns in all Upper Canada.

Coot's Paradise is a very singular place. It is also, like the Bay of Burlington, of a triangular shape, but not one-fortieth part the size. Banks all round it are very high. It derived its name from a sportsman called *Coots*, who considered himself in Paradise when he got amongst the immense flocks of wild water-fowl that haunt it: he would move about with his *punt* amongst the

rushes, and shoot them by dozens. I have never seen such a variety of wild-fowl as comes to this place. Had time permitted me, some curious stuffed birds might have been obtained from this *Paradise*. It is, therefore, strongly recommended to ornithologists and sportsmen, as a place, above all others yet known in Canada, most deserving of attention. It is a *swamp* acted upon by a *tide*: this is a very rare thing to meet with. The waters rush over it from the bay when a lake storm exists; and when it lulls, the waters fall back, and leave it a paradise for water-fowl. As these tides irrigate the *wild rice* that grows luxuriantly in it, perhaps it might be made a most valuable *rice-farm*; as such the agriculturist should examine it. If suitable for this purpose, it would form the richest farm in Canada; there is no doubt of it. It may contain about 350 acres.

Mr. Brandt, the celebrated Indian Chief of the Mohawk Indians, lives on the banks of the bay; a polite, kind gentleman, a great favourite of mine, and well beloved by all who know him. We were talking about his schools, which he has erected to teach his Indian youth, when two of the Mohawk hunters brought him a present of wild ducks and pikes from the bay: they threw them down on the carpet of the parlour without any ceremony,

and he never seemed to thank them, nor did they seem to expect any thanks ; some words and a nod or so passed between, and they went away as they came, quite contented.

Burlington Bay, with the adjoining country, is the loveliest place in civilized Canada. The natural beauty, the fertility, the amusements which may be obtained in hunting and fishing, are greater than I have met with in any other place. The *swamp* creates sickness, however ; and until it be buried by a depth of water, will continue to trouble the worthy inhabitants.

The Forty-Mile Creek.

All round the head of Lake Ontario, large creeks or valleys are met with, running far into the country,—at right angles, generally speaking, with the lake. The fertility of these valleys is great, and they are all in a high state of cultivation, and full of settlers ; in the greater number there are villages, with churches and mills. Some of these mills are the largest I have seen, and well managed. Wherever stone can be procured, the houses are built of it in preference to timber. These creeks are named by their distance from *Little York* or *Niagara* ; the *forty-mile* one seems the largest of them. Here is a neat vil-

lage, chiefly built of stone; and when there in 1827, I observed a stone wall being built round the churchyard, which greatly pleased me; for these sacred receptacles for the dead are not paid that attention to they deserve: they are generally laid out in a piece of the worst land that can be selected, where a grave cannot be dug without much labour. I love to see a church built in a rich pleasant spot, closely flanked by little houses, with people in the church-yard now and then, letting a tear drop over the graves of their departed friends. When I see a church without houses, and a churchyard unfenced, doubts arise respecting the morality of the people. In these lovely glens of the lake, nothing was met with of a harassing nature to the feelings; the people seemed all to be enjoying life, were tolerably fat, and always well clad. In the little inns they were very kind: this is universal in Dutch settlements, or amongst the French Canadians. The Dutch, however, make better farmers than the *French*, and spare no pains in improving their lands to the utmost. They grow enormous quantities of the finest apples, and make a corresponding quantum of excellent cider.

CANOES AND COTTAGES.

THE canoes are generally made of *birch bark*, extremely neat, light, and altogether constructed with the greatest ingenuity; improvements one after another have been added through a lapse of ages, and now they may be said to be really bordering on perfection. No straight lines are here made use of in the moulding, but aquatic curves of the very first order, so that they may carry an immense load, and yet meet the water with the least resistance possible—formed light, yet very tight and strong. Birch bark of a yellowish colour, without wrinkles, is generally considered the best, and will last the longest: this bark is found in the remote woods, and the canoes from the inland territories of the north are always preferred. It is rare to meet the Indian carpenters at work: they will walk through the *yards* with

us, which are commonly to be met with on the obscure banks of some lonely lake, and show every thing; but they will not let us see them actually applying their moulds, like the artists of Britain. The dimensions of a canoe are not given by breadth of beam, depth of hold, &c. but by fathoms in length, from the shoulder of the bow to the bends of the stern.

They will live in very agitated waters, where our boats would inevitably founder. The largest kinds of canoes are those of *four* and *five fathoms*. It is truly frightful to see them running rapids of rivers, in which, every moment, they are either expected to be upset or swamped, by those who do not understand them; but the Indians and Canadians can manage them in a superior style. They will, with the largest, pass a portage of a mile, in less than half an hour, although they may have nearly a ton of luggage to carry. Three men will easily run along with a canoe on their shoulders, which in the water is laden with the before-mentioned burthen, and probably twelve paddlers. No boats in the world can carry, or be carried, like them; but they do not sail very fast: perhaps five miles an hour may be about the medium rate of sailing. They swim in very little water; one drawing nine inches is consi-

dered to be deep. Sometimes a mast and sail are raised to a fair wind, and then they fly along the lakes like swallows. They are carried with the bottom up, the gunwale resting on the shoulders of the bearers, who have a cord over the bow and stern, to balance the huge-looking burthen. On the sides of the return bows and sterns, various animals, such as serpents and beavers, are beautifully painted. The *timbers*, as I may say, are fine split pine or cedar: they are sewed with stripes of the *leatherwood-tree*, and the seams *gummed* with the juice of the tamarack-shrub. When they spring a leak, they run them instantly ashore, pull them from the waters, and turn the bottom up; a fire is then kindled, and a burning cleft faggot is taken and run along the seams, while the voyager blows through the cleft; this melts the gum, which is then pressed down by the thumb, and so the cure is effected. If a hole has been punched in the bark, the piece is extracted, and a new piece inserted. When done, she is soon in the water, and away again on the voyage. Log canoes are likewise very common, but chiefly used amongst the settlers. They are scooped and moulded, as every one knows, out of the trunks of trees, and are quite inferior, in every sense of the word, to the birch canoes, being heavier, more

liable to upset, and more difficult to be repaired when out of order; they likewise draw more water, crack with the sun, and rot very soon. They have a singular method of applying oars to them, by fixing an arm on each side, with a pin through the end, to act as a fulcrum to the oar: so rigged, a single rower can send a canoe of this kind very rapidly forward. It is a singular fact respecting canoes, that a couple of paddlers in a small one, will outrun another manned with twenty. There are few finer scenes than a Canadian Regatta: fifty canoes on the smooth broad lake, voyagers fancifully adorned, the song up in full chorus, blades of the paddles flashing in the sun as they rapidly lift and dip, while the watery foambells hurry into the hollow of the wakes.

The orders of architecture baffle all description: every one builds his cottage or house according to his fancy; and it is not a difficult thing, in passing through the country, to tell what nation the natives of the houses *hail from*, if we are aware of any of the whims or conceits that characterize them. Thus a plain rectangular house of brick or stone, with five windows and a door in front, and a window, perhaps, in either gable; the barns, sheds, stables, and offices at a respect-

able distance behind ; a kitchen-garden off at one end, full of turnips, melons, onions, cabbages, &c. and at the other an orchard, full of fruit-trees, with a range of beehives in a corner, is the dwelling of an honest English farmer.—The wealthy Lowland Scotchman follows the same plan nearly: there is not such an air of neatness and uniformity, but there is more live stock about the doors: the pool, or river, is full of geese and ducks, while round the barn are numerous flocks of hens and turkeys; a favourite cow, perhaps, hangs on for friendship about the gate; a sow comes forth with her litter; and the cur-dogs seem not to be scarce.

A house larger than either of these, chiefly built of wood, and painted white, with nine windows and a door in front, seven windows in either gable, and a *semicircular* one above all, almost at the top of the angle of the roof, the blinds painted green, the chimney stalks highly ornamented, and also the fanlight at the door; the barns, stables, &c. off from the house at a great distance; the arches of all the shed-doors turned of wood in eccentric elliptics; live stock not very plentiful about the place; a disposition to be showy and clean, without neatness, proportion, or substantiality; a good-looking girl, I might say, about the head, but the shoes not shining with *Warren's*

best, with a tolerably well-made gown on, not very tawdry, the petticoats, which may sometimes be seen if we mind our eye, having no charms, and any thing but the colour of the snow,—it is almost needless for me to say, that this is the mansion of Jonathan, or the U. E. Loyalist from the United States.

A house nearly as large as the American's, but built of stone, and high roofed, having two tall chimney stalks growing out of either gable; an attempt to be showy and substantial, without rhyme or reason; an air of great miscalculation, and a woeful sacrifice made with the intention to gain something, which something does not seem to have been properly defined; a disposition evidently for a house like no other person's, beyond the reach of architecture, generally met with in a state of dilapidation and decay, the window-panes sadly mutilated, old straw-hats stuck in to keep out the wind, and so forth,—this (and there are many such places) was intended for the abode of a person who had made a few thousand pounds by the fur-trade—a wild pushing Highland-man, who had often seen the remotest regions of the north-west.

The French Canadian has a little house with verandas all round, few windows, and few fancies; every thing done with an air of humble

comfort; a windmill, perhaps, turns round on the top of one chimney, and a *cross* is stuck up on another; if a large pole stands before the door with a cock perched on the top of it, the owner is a captain in the Native Militia.—The Dutch copy the Canadians: have their houses small and comfortable, but without much uniformity, and they seem to dislike little *toys*, such as windmills: if the house can be surrounded with an orchard, they will have it done; and above the well is sure to be placed the long Dutch lever, a large spar, often nearly thirty feet long, balanced on a fulcrum of about twelve feet high; a chain is fixed to the upper end, and a hook, by which the *can* or pail is let down into the well, and when full, the lever, to return to its equilibrium, assists the drawer of water to bring it up—a simple and useful invention.

CANADIAN IMPROVEMENTS.

THE improvements already proposed are somewhat curious in their way, and to those who may never have heard of them, may become both amusing and instructive. On *St. Paul's Island* there is a *light-house* to be built, to assist in conducting mariners through the dreary Gulf of St. Lawrence. This light should be eighty feet above the level of the ocean : if any higher, it will be frequently obscured by fog ; if lower, the curvature of the waters will prevent it from being seen at the entrance of the gulf. The lower a light can be kept, the better, so as, nevertheless, to be seen twenty miles distant, as the density of the fogs are less near the surface than they are above. This light should be either a *revolver* or a *galloper* ; the latter is preferable, as more distinct, and not to be mistaken for any other light,—a thing very necessary on the

coasts of America, particularly on those of the United States, where every rock and headland has a light, so that their multiplicity tends more to bewilder than guide. To obtain this required object, coals should not be used, but *gas* from *resinous wood*, which abounds on the shores of the Gulf. Nothing but a small portable *retort* and *furnace* is required. The expense of this lighthouse will be about 5000*l*.

Captain Lambly, of Quebec, is certainly a worthy harbour-master, and ever looking round him for the benefit of the maritime public. An harbour in the Island of Anticosti is evidently required, as there is no port open for ships in distress, or ships detained by unfavourable winds, between Quebec and the Gulf, and a harbour could be made there which would answer every purpose. The expenses of forming it would be about 10,000*l*.

A dock at Quebec, which would keep the trade from being transacted in the wild current of the river, is certainly a desideratum to wharfs surrounding a basin of still-water; and it can be easily obtained at the mouth of the River St. Charles. The French saw this proposed improvement long ago, and made some attempt to put it into execution. This dock requires only wharf-walls, a lock, and pair of gates, with their wing-walls; the exca-

vation of the whole would be simple and easy. At present merchants about Quebec object to this dock; but why should trade suffer by petty interests? The expense of this grand improvement would be 32,000*l*.

Water-works at Quebec are an object proposed by every body, and it is sometimes thought that this needful element will be brought to the city in pipes from a distance of five miles. It may be got more easily out of the river, by a sixty-horse power steam-engine.

The best plan, probably, would be to make a reservoir somewhere about *Louis Gate*, and there is water always springing round the skirts of Cape Diamond which would keep it full. From this it might be carried in pipes all over the town, high and low; and this supply might answer for the citizens both in time of war and peace. And should the water for some purposes prove *hard*, as it is sometimes termed, more ductile river fluid might be had, by placing a *hydraulic forcing-engine* in the current of the St. Lawrence. This engine would be endowed with tremendous power, by a proper application of the current. About 15,000*l*. would supply water to Quebec. The half of this sum would light it up with gas, an object greatly desired. The gasometer might be placed on the side of the

River St. Charles. *Seal oil* would produce good gas, and so would that of the *porpoise* and *grampus*; also resinous wood, and gum of turpentine, found in the bush. Were companies to form and execute the water and gas-works, about 8l. per cent. would be their profit. Private companies should not be allowed to work in a garrisoned town like Quebec;—these ought to be Government works.

A chain-bridge at Quebec has been discussed very frequently, and the practicability of the same much doubted by many individuals. Certainly, a chain-bridge to stretch across the St. Lawrence from *Cape Diamond* to *Point Levi*, a distance of more than a mile, where the current is strong and water deep, seems no easy task; yet it might be performed, if sufficient caution, patience, and money, were produced for its construction. The chain-bridge would require five *floating-piers*; and these may be so constructed, and so anchored, that even the heaviest drift ice rushing before a flood, would not be able to sweep them away. If, then, a bridge be really desired across the river at Quebec, it is hoped that those who ought to speak in its favour, will say nothing against it on the score that it *cannot be performed*; for the work can be done, and in such a manner,

that the navigation will not be interrupted thereby in the least degree. The expenses attending such an undertaking, considering contingencies, might probably amount to 40,000*l.*; nothing less, at least, could possibly answer.

Between Quebec and Montreal, the River St. Lawrence spreads out, at a certain place called Lake St. Peter, and becomes rather shallow for vessels of 400 tons, drawing twelve feet of water. The channel through this lake is proposed to be deepened, and engineers of eminence have carefully bored, sounded, and explored the same. The public await their plans and conclusions with much anxiety. Doubtless, they will employ the steam-dredging machine; but if the current be strong, and bottom running sand, the steam-drag will be found to be useful; and if danger be apprehended that the channel, after being deepened, will fill up again, probably *skids* along the banks, for the sand to back against, might answer a good end; as, the higher banks can be raised, the deeper will get the channel. Dredging-machines and diving-bells are engines much required in Canada, and may probably appear at work in it before long, to deepen this channel. Report says 14,000*l.* will be necessary.

The harbour of Montreal requires attention,

and is really not receiving so much as it ought, for this will be a large city in a short time, and should be properly regulated. Why have the citizens filled up that beautiful dock or basin which Nature, out of her extreme kindness, has given them? This is absolutely a shame. No man loves a dock more than a merchant, and no man is blinder than he as to where a dock should be made. For the sake of all parties, let not this place be built up with houses. Keep the builders back! Confound brick and mortar! When the day comes, as come it will, when up to this basin by the creek come the steam-boats, and wharfs are all along its sides from the Current St. Mary's, and when the merchant-ships meet them by the creek from the harbour, what a trade in the very heart of the city will there then be! Montreal is the Liverpool of Canada; to it, by the canal and river, will flow the wealth of all the Upper Provinces; it will become an emporium for the treasures of the interior. This city, like Quebec, should be lighted up with gas.

Canadian Signals.

Along the whole extent of the boundary line between Canada and the huge American republic, telegraphs might be placed to the greatest ad-

vantage on the summits of the lofty mountains, by which we might easily learn the movements of the enemy, or of the ships in the Gulf and River St. Lawrence: they ought to be placed from ocean to ocean, and would serve to define our unknown property more distinctly: it was the method our forefathers took when claiming their rights to disputed lands. At night the signals might be well conveyed by placing lights in certain order, which lights might tell the transactions of the day, or the discoveries of the telescope. Perhaps there is no improvement that can be suggested better than this for the country. Confines to look at, are cheerful; boundless wilds are discouraging and dreary. How delightful to us Britons to see the ocean rolling round us! Were it a wilderness of trees and rocks instead, the effect would not be so great. Let us, therefore, have telegraph stations on *Cape Breton*; on mountains along the banks of the St. Lawrence and shores of the Great Lakes; on the Rocky Mountains, and by the mouth of the Columbia, nigh the Pacific Ocean. To plant them would be a thing of the greatest ease. Let huts be built at them, and the Indians would be delighted to manage them: they would do it for nothing almost in time of peace; and in war, of course, we

find it our interest to watch them ourselves. Gourlay, I dare say, hinted at this, when he talked of erecting *cast-iron posts* along the boundary lines, with the *Highway of George the Fourth* stamped upon them. Having mentioned Mr. Gourlay, I may add, that whatever opinion the public may have formed of this unfortunate person, his *book* on Canada is by far the best that has yet been written: it contains more local information than all the rest put together. As to his political creed, his furious enthusiasm, and "grand scheme of emigration," as he is pleased to term it,—these things are no favourites of mine. The author was basely and inhumanly treated abroad, nor does it seem that we used him much better at home.

CANADIAN MINTAGE AND CASH CIRCULATION.

THE money in circulation is chiefly what is called *dollar-bills*, being provincial bank-notes, and *Yankee half-dollars*, which are about the size of half-crown pieces; silver coins having *eagles*, *stars*, and emblems of liberty stamped upon them. British coins are very rare, and are eagerly inquired after; a *sovereign* is worth 24s. currency. *Money matters* are of a perplexing nature; a *Stock Exchange broker* would be baffled, for some time, to manage them properly, the *exchanges* and *premiums* vary so much. The troops are paid in *army sterling*, with dollars valued at 4s. 4d.—with merchants, 4s. 6d. 100l. sterling is 115l. 7s. 8½d. currency, and 100l. currency is 86l. 1s. 4d. sterling. On a bank bill of exchange for 100l. sterling, I have paid 125l. 12s. currency.

There are numbers of *shillings* in circulation,

out being the mintage of all nations, few can tell the exact value of them, unless weighed as *old silver*, which is never done, except one has a quantity of them. Who can be *bothered* with weighing single shillings, as we require them for casual payments? and more than that, we cannot do it *every where*, were we willing; for where is a *sensitive* pair of scales to be had in every shop, with the necessary *drachms* for balancing the matter? and then to carry a *weigh-beam* about would be troublesome. While the *French* keep gabbling about *quinze sous*, and *trente sous*, which are perplexing to comprehend; every sort of a *copper-piece* is an halfpenny. I have no less than 120 different kinds, the greater part of them *old copper coins* of Britain, and merchants' *tokens* all over the world. If a lot of *farthings* be taken into a *smithery*, and receive a blow from the sledge-hammer on the anvil, they will then be excellent *Canadian coppers*, or half-pennies. Some attention, by those who ought to give it, if any such there be, should be bestowed on the *money* business of Canada. In the trade of *sovereigns* and British coin, considerable profits are, and might be made: I am surprised to find so few regular trading *Jews* in this business. Take over a *bagfull* of coins, and they may be disposed of to much advantage, and keep

the *Yankee* dollars out of the market ; for the very *coins* of a realm, like the *songs*, affect its character. The *emblems* on the current coins of Canada help to make Yankees of the Colonists. At the same time, it would be difficult to establish a Canadian *mint* ; the Americans must coin for us there, so much the more pity. Rich men are by no means plentiful ; indeed, a 20,000*l.* man is very rare. Ladies with fortunes are, therefore, not in Canada, so fortune-hunters may seek for game nearer home. There are *banks* in the chief towns : *rags* and *rag-cooks*, as our doughty Cobbett has them and their bills. The American system of banking is indeed curious : wherever a canal, road, bridge, &c. or other large work is going on, a bank is started beside it ; not a *branch bank* of some large establishment, as in Britain, but a bank purely for the business of that work alone, whatever it may be—as the *Erie Canal Bank*. In these dens of knavery, contractors can so manage their labourers and artists with *flash* credit, that payments in full can never be effected ; and the contractors themselves are so led by the nose, by the *agents* of the work, and the bankers, that they are often cheated of large amounts ; but there are few complaints heard, not a murmur will come from the lips of Jonathan. It is

a truth that their *public works* are constructed without any one knowing who *paid* for them, and therefore they are *public works* indeed, and may well be exempted from *tolls* and *taxes*. A regular set of *rogues* employed together is a scene worthy the contemplation of a mannerist.

An American contractor on the Rideau Canal paid a visit to the States, and returned with a budget of *Auburn bills*, seemingly *bank-notes*: these he flashed about everywhere, and some of the unknowing were a little deluded. He also brought with him a *sleigh* and *span of horses*, not to be matched in the country for elegance. While eating our *bread and onions* at dinner one day, he drove up to the humble cottage, and requested me to take a drive with him. Away we went delightfully, for the *sleighbing* was fine, and pulled up at the *Columbian Hotel*, *en passant*, where we jumped out to *taste* a little of *something*, but more evidently with the intent of showing off. While *cutting* an important *swell* through the halls of the hotel, before a number of people, he pulled out a bunch of *Auburn bills*, and, without my paying much attention, pushed them into my hands, saying, "Take these, Mac, my boy; I guess you'll never want money while *one* of them here bills is in your pocket."—"No, no, my good fel-

low," I replied, returning them to him ; " that *big dam* you are building must not have a *blind gauger*." He took the hint, the story took wing, and I afterwards met it in various parts of the country. America is not a *laughing nation* ; a hearty laugh is not to be heard, except amongst the Canadians ;—the *crafty, chatty laugh* is frequent. The tears of laughter never bedewed the Yankee's cheek ; they are too full of plots for giving way to this, and " the loud laugh that bespeaks the vacant mind," as the poet says : however, the *Auburn bills* created some fun in the wilderness of Rideau. All the labourers on the Canal were paid in *Yankee half-dollars* ; the commissariat furnished these to the contractors, brought up in *boxes* from Montreal. It was curious enough to see the contractors crawling through the woods with their *dollar-bags* on their backs. Poor fellows ! the trouble Government found in making ready cash payments involved many of them in great distress.

The *vouchers* required so many *signatures* that they were difficult to be obtained, as one officer was here, and another there, over the whole extent of the line ; but this difficulty is unknown where the *work* and the *officers* are at *one place*. Had the *contractors* been people who had had plenty of

money of their own, then the Government might have taken its own time to pay them for work performed; but being poor, the case was different, and much distress arose from this cause. Sometimes the whole of the necessary officers, clerks, &c. forming a *moveable Somerset House*, as it were, would go through the line, and make payments according to progress and measurements; but this plan, again, was attended with much expense. In other large works, not conducted by Government, an agent is deputed to pay the money, so that distress arising from the procuring of *signatures* is avoided. This *voucher-hunting* business, as we called it, did much injury to the character of all persons connected with the public works, and to the Canal itself. We were blamed because *ready payments*, according to the system of accounts, could not be made, and for the works being neglected by the contractors hunting up and down in quest of *names*, that they might have the *military chest* opened by producing the required documents, and the money drawn out. Government requires so many *checks*, that her very securities become bewildering; and accounts, which at first are simplicity itself, become filled with various perplexities: we managed, however, to keep them correct.

THE UNION-BRIDGE.

THIS is the largest bridge in the country : it is over the Ottawa river, 120 miles from Montreal. The following letter, sent to a friend shortly after I arrived at it, will describe the place.

“ Falls of Chaudiere (Ottawa River), Oct. 18, 1826.

“ SINCE I left Clamp’s Coffee-house, I have been quite in my element, plunging amongst woods and waters, exploring and engineering. On my wandering thither, I found that the Governor and my commander, Colonel By, had laid me out plenty of work to superintend. What think ye of a bridge of stone over the Grand River,—a Union Bridge to connect Upper and Lower Canada? A more imposing situation for such a piece of architecture could no where be found. The arches are to curve between a chain of rocky islands, di-

rectly over the magnificent and splendid Falls of Chaudiere ! Behold but the scene, look at the mass of waters coming smoking over the shelving precipices, formed of the hardest horizontal strata of laminated limestone :—down they tumble, in some places more than one hundred feet, into the cauldrons or kettles beneath ; where, instead of their furiously driving, as you may imagine, down the channel, they in some instances vanish fairly, work their way through subterranean passages, and come up boiling white half a mile down the river. It has been told me by one of my countrymen here, that a *cow* one morning tumbled into the *Little Kettle*, or Chaudiere, and came up again at Fox Point, ten miles down the river ; and on my inquiring if she came up alive, he exclaimed, with all the *water kelpie* enthusiasm of his own old Scotland, ‘That she did sae ; she came up *rowting*, and lived fat and fu’ for years after.’

“ But, to lay joking aside, this bridge, if we manage to build and finish it off as we ought, will surpass almost any other in the world as a wonderful piece of superstructure. It is to have eight arches : five of 60 feet span, two of 70 feet, and one of 200 feet over the *Big Kettle*, where sounding-line hath not yet found a bottom at 300 feet deep. One of these bridges, of 60 feet span, we are just finishing,

and putting up the centering for one of the 70 feet arches. Materials are just for the lifting, of the best quality. Nature never was so kind; plenty of timber, plenty of stone, good abutments—the truth is, we build no abutments, but spring with the arches directly from the rocks themselves. The road-way will be about 30 feet wide; and as the spring floods of the Ottawa rise 24 feet, we are obliged to raise the arches high to keep out of harm's way.

“Our master-mason is M'Kay, from Montreal, he who built the locks of the Lachine Canal, from the plans of poor Burnett, the engineer. Mac is a good practical mason, and scorns to *slim* any work: this is to my liking, as I cannot suffer *sliming* and shuffling on any account. We are also busy forming a channel through the rapids, for the sake of the raftsmen. This is done by building two strong dams, and deepening what is called a *dry snie*. Can this word *snie*, for a channel, be French, or Indian? I am inclined to think the latter. By the way, the Indians here amuse me; often they come by the works, canoe on their heads, and there they will stand and wonder sometimes for a quarter of an hour together. Not so the Canadian voyagers; they have no curiosity, but pass the portage without looking to the right or left. The

Indians are full of reflection, and some of them vastly clever: one in particular, a young man belonging to the Lake of the Two Mountains, who came thither as a guide to two officers of engineers from Lake Simcoe, drew out the whole line of the route travelled, and, when shown to the engineers he had conducted, they agreed with him at once, that the whole was executed most correctly; more so, I doubt, than many of our *scientists* could do—for all I love the Canadians. Give me plenty of Canadian labourers and Irishmen, but let them work apart, and wonders may be wrought: as to Jonathan, I know not what to think. He comes here *guessing*, and after he has pried about for two or three days, goes away, and calculates that we have ‘pretty considerable of a work in hand:’ but it won’t suit him; he wants to fill his pockets, he cares not how; but so long as a Scot is the Gauger, I’ll be hanged if he shall!

“We have laid out two villages, and all the lots are taken up; it surprises me to see the anxiety people have to become citizens here. On a morning, I have sometimes about me such swarms, that I cry out with the goose in the fable, ‘that all the world and *his wife* are here.’ I love to oblige all; but I find that, the more I oblige, the less thanks I have. There are no females here,

except an old, smoked, Canadian's wife—no other woman is to be seen; and there are 150 young men.

“The grand entrance-bay for the canal lies between the Falls of Chaudiere and the Falls of the Rideau. The land on both sides of this bay, which is not more than 400 feet wide, rises high—about 250 feet. On one side, Colonel By has proposed a battery to be built, or fort, and on the other his own house: in this valley the trees and brushwood are clearing out, and chateaus building. At the beach, two large wharfs are constructing, on which to land Government stores. Not less than 500 yards from the shore the grand canal will have eight locks, as the land rises quickly, which, on coming up the river, will look beautiful, as these locks will take in steam-boats of large dimensions. The weather keeps fine, and I do not think we shall have any snow at all this winter: at all events, we mean to continue the works, be the weather foul or fair. We are set to it in earnest, and expect to drive the levels through as far as between Perth and Gananoque this fall. So much towards the Rideau Canal;—and had we got over the Atlantic sooner, more of course would have been done.

“You jog on, as usual, I expect, in Montreal.

What think you of putting a wharf round the harbour there, and opening a basin at that creek in the centre of the same for the shipping, while the Steam-boat Canal runs up to it from the Cross, and from thence to Porteus' Basin, on the Lachine Canal? It strikes me, some way or other, that Montreal is going to be a large town at some future, but no distant period, and that a few of you are spoiling it:—look to these Nuns, how they have filled up, during the last month, one of the chief streets with a rumble of a building, intended as a hospital, but that looks more like a jail. Excuse me, my good Sir, for so much nonsense; I got upon my hobby, and the Devil would not unhorse me."

The following account was drawn up in a more careful manner:—

"Report on the Chaudiere Bridge.

"HAVING surveyed and examined the site for the proposed bridge of communication between Upper and Lower Canada, at the great Falls of Chaudiere, Grand River Ottawa, we now dare to report thereon as follows:—

"On each side of the main channel, or Big Kettle, there are several small channels, four of which must be passed on arches. Two of these

channels are on the north, and two on the south side of the main channel. The first arch on the north side will require to be 57 feet span, and 15 feet 6 inches rise, with abutments, as the rock is not sound. The second will require no abutments: the span is 25 feet, and height 10; this little arch will spring from the solid rock. The first channel, on the south side, viz. that over the new timber snie, will require to be 80 feet span, and 20 feet rise, with abutments 4 feet high on each side, so that rafts and raftsmen may freely pass through beneath. The second, 70 feet span, and 18 feet rise over the *lost channel*: no abutments for this one will be necessary; the arch may spring from the solid rock; and from the nature of the banks and the waterfalls at this place, this arch will have the most beautiful situation of the whole. These arches are all proposed to be formed of blocks of limestone, hammer-dressed and rough-picked to their respective radii; to be all laid without mortar. For the arch of 57 feet span, we consider that blocks three feet depth of face by one foot thick, may answer. That of 25 feet span will require them 2 feet and a quarter by 8 inches. And the 70 and 80 feet arches should have arch stones at least 3 feet 6 inches in the face, and 1 foot 3 inches thick. We would hope, however,

that if any stone of a stronger quality could be found than that about the Falls, and could be obtained without much trouble, such ought surely to be received for building the arches.

“To get safely and economically across the main channel, or Big Kettle, becomes the only question of interest as regards this wonderful Union Bridge. The mind of the engineer flies first to wood for this purpose, and considers it might do very well; but after measuring, sounding, boating, and pondering the subject maturely, he finds wood would not answer so well as at first supposed; for the distance is full 200 feet across, which would require an immensely strong frame truss, as no support can be had from the bottom of the kettle, which is out of soundings, nor can a boat live very comfortably on the surface of the boiling cauldron; moreover, were it even possible to get a wood bridge trussed over this romantic place, it would always be wet with the spray of the Falls, and consequently be subject to rapid dissolution. Were this ever done, however, we would propose that this wooden truss should form the centering for a stone bridge of 200 feet span. Plenty of fine granite blocks are to be had in the mountains of Hull, about four miles from the place, which would answer well: these blocks

should be about 5 feet deep in the face, and not less than 18 inches thick. Were this work ever done, and done without mortar, it would evidently, from its situation, be the most beautiful in the world. We should also suggest, that if this grand arch be ever built of stone, it should be the segment of a circle, 40 feet the rise or height of arch, and 30 feet wide.

“As an arch, however, of this description cannot at the present time, and in the present state of the infant colonies, be carried into effect, we are obliged, therefore, to look around us for the best substitute we can find; and this, we imagine, is a catenary chain-bar-bridge; a detailed account of which may not be uninteresting, and we therefore give it.

“Iron chain-bridges are an invention of the ingenious Capt. Samuel Brown, R. N. also patentee of the chain-cable. The first chain-bridge ever constructed in Britain was that across the River Tweed, at Berwick. Iron chain-bar-bridges are an invention of the celebrated Mr. Telford, and he has used them with wonderful ingenuity in his grand bridge over the Straits of Bangor, 517 feet wide. Since then they have been used successfully in many smaller bridges; as at that over the Thames at Hammersmith, where the river is

400 feet wide. They consist in forming chains of wrought-iron bars, bolted together; sometimes four bars go to form a chain, sometimes five; the bars are bolted, and of a thickness thought proper for the weight they have to support. The chain we should think proper for the Union Bridge should be formed of the common bar iron of the country, three quarters of an inch thick, 4 inches broad, and 10 feet long; the bolts should be $1\frac{1}{2}$ inches diameter, with a head, linch-pin, and hole: four of these bars should form a chain, and there should be five chains, each 5 feet asunder, giving thus a bridge of 25 feet wide. Great pains should be taken in punching the holes in the iron bars to receive the bolts; no welding is allowed, and if a cracked bar is observed, it should instantly be condemned. The smith-work should be particularly well done; in this department no pains ought to be spared, and nothing should be hurried out of hand before it is properly finished.

"On the north side of the main channel is a singular island of rock, called Pier Isle, because it seems formed by nature for the pier of a chain-bridge. By referring to the section, this will very strikingly appear. Over this we propose the chains to come, and to continue 120 feet farther, where they will pass over a small pier of eight feet high,

and then be fastened to the solid rock by cross-bars, bolts, &c. according to the common method.

“ Were the chain-bridge to terminate abruptly at Pier Isle, two stone arches more of 60 feet span each would be necessary, which would be much more expensive than continuing the chains ; and if the chains were suddenly checked at Pier Isle, which they would have to be if stone bridges were to be built, then the chains would be in danger of snapping, as they would have to turn an angle too acute ; and an allowance ought always be made for this, as also for the contractive and expansive nature of iron.

“ With respect to this iron-bridge, which is by far the most economical we can propose, the roadway, instead of being suspended beneath the chains, as is the common method, is supported above them. This method, we own, is not so proper as the common way, as it throws the centre of gravity above the centre of suspension. The one way, however, is equally strong with the other, but not equally steady ; and this last has been erected by Mons. Brunel, the celebrated French engineer, with much success, over some of the wide rivers of France. The plan and specification will detail the whole minutely.

"The expenses of this Bridge may seem large, but they are not so great as they really should be. We hope such an interesting undertaking as the Union Bridge, which will confer great benefit on both Provinces, will meet with every attention and regard; and that not only the Imperial but the Provincial Legislatures of the Canadas, will liberally assist in the erection of the superstructure."

To build a *stone-bridge* over one of the *wildest* rapids, and in the *depth* of a very severe winter, was amongst the most arduous of my undertakings in Canada. Had I known what a *winter* was absolutely like in the country, perhaps I might have shuddered to make the attempt; but this being my *first*, the business was set about without much dread. The idea was, it would be *extremely* cold; and the general opinion, that the thing could not be done during that inclement season; it would be difficult to construct it even in summer, *bridge-builders* being rare, and mechanics very scarce in the colony; moreover, *no* mortar could be used, and nobody knew any thing about *dry-stone* bridges. To attempt the rearing of such a structure in England, in winter, with all our tools about us, in *such* a situation—

but *such* a one is nowhere to be found—would be considered madness. However, we dared this in the wilderness, and succeeded.

It somewhat vexed me to find the *master-mason* amongst those who reasoned “that it could not be built in such a place, in such a season of the year, and according to such a plan of arching with dry-stone;” and to do away with *quibbles* that might afterwards arise regarding opinions, he was made to *sign* his name to his views as given, he being the *only* person whose *ideas* were valued, and not only the best mason in the colony, but one of the most sensible and worthy of men. He vowed to stick by me through thick and thin, as he has done most faithfully; and so he set to work with his people, under my directions. The span was 60 feet, rise 18 feet, width 24 feet. Banks of shelving limestone were 20 feet high; excellent blocks to be obtained about 500 yards from the proposed bridge. I was actuated by various causes to set about this work. A temporary bridge had been thrown over the same place before, which had fallen. There were a *number* of masons also out of employ, and the finding work for them a month or two in winter, by keeping them together near the public-works, was likewise a consideration. I was also anxious to learn if

people could *quarry* and *dress* stone during the *cold half* of the Canadian year; moreover, to know if such an *arch* could be constructed of limestone-blocks, sledge-picked to the radius of the circle of which it formed a segment. The trial was rather daring; and looking to the fate of the former, to the original plan of this, and the situation I held respecting it, it created in my mind some anxiety. There was a climate to contend with, and a plan to execute according to that climate,—to both of which I was a stranger, having never seen, far less built, a *dry-stone bridge*. I felt *reputation* at stake; but then a *proof* would be obtained, if the thing succeeded, whereby much work might be done in the same way, to the benefit of many countries. Accordingly very determined resolutions and resignations had to be entered into on my part.

A wandering mill-wright lad from Aberdeen succeeded admirably with the centering; and when put *up*, he was employed to form a *scarf-screen*, to keep the spray of the falls from the workmen. Morning, noon, and night he had to examine the centres, to be informed if the frost, which was intense, had any effect upon them. Every morning, the first thing done was to sweep the snow away, which generally fell, more or less, during

the night, and to cut clear the immense floats of ice which came down the Rapids, and were arrested by the frost round the abutments. Sometimes they would come in such quantities as to choke up the Rapid altogether, while the water backing up would freeze over, forming the bridge and all into one huge mass of ice. But now a curious circumstance took place: the Rapid being as it were dammed up, the water found its way round the rocky island, and down a gut on the other side, while a considerable portion tumbled into a cauldron called the *Little Kettle*, and went out by its subterranean passage to the Ottawa. The master-mason also was very active amongst the quarriers and at the bridge; he saw every block cut to its proper mould. These were generally three feet long by two broad, and about sixteen inches thick; they were dressed chiefly in the quarry, and afterwards drawn upon a traineau, or sledge, to the bridge, by both oxen and horses. When there, they were moved into their courses by the masons with crow-bars, and settled down on the *coomhead* by a large mallet of hard wood. When the haunches of the arch were thus raised, for the *blocks* could be taken across on the ice to the island on the other side, the mill-wright erected a triangle; and,

by a block and tackle, they were hoisted on to a stage made of three-inch plank, which acted as an inclined plane, and brought up the arch-stones to the crown. The key-stones were afterwards put in by *Lewis*, that is, an iron bolt of a construction well known to artists, let into a hole at top; a fulcrum was raised, and the lever over it, laid them quietly into their places, ever fearing lest the frost should spring the centres; bundles of straw were laid on the *coomhead*, for the stones to fall on when putting into their courses, so that percussion might be obviated as much as possible. Thus we wrought on, day after day. The artists were well looked after; their master found them in the best food and lodging the dismal place could afford, and grog was served round once, and sometimes twice a day, as we found the store to hold out. No man was frost-bitten but one; and there were only *two* days in the whole winter they could not work for absolute cold:—those indeed were dreadful; the snow drifted into huge wreaths; my hands were *bitten* while in the act of shaving, in a room where there was no fire. That day the mercury froze in the thermometer in many parts of the country.

Having built the bridge, we set off to Montreal, and on telling the people there what we had done,

they would hardly believe us; but as we had not *struck the centres*, that is, taken away the frame from under the arch, we were considered not to have done the job entirely. Accordingly, these were to be struck without delay. I remonstrated something against this, as the *frost* had destroyed friction to a great degree, so that the arch-stones were packed along side one another, as if they were *lumps of ice*; and also it had rendered them brittle, so that if the *centres* were knocked out, then the pressure of the arch might squeeze the stones out of their places, and probably break many of them; thinking that it would be much safer to let the bridge remain as it was until the thaw came, when the frame should be removed, some day, between the thaw and the flood,—as if the flood came on, and the centres *unstruck*, it would sweep all before it. However, the public would have them out, and a cautious carpenter from Edinburgh was sent to do it. Before he left town, however, I gave him my best instructions, and a letter to the mill-wright how to act. Having got up the Ottawa to the place, after having the ice and snow cleared away, the *wedges* were slackened with great care, the arch sunk not *an inch*, away went the centres, and left it to its own equilibrium; for the blocks were

well dressed to the radius, as in doing this properly the main secret lay. The great floods of the Ottawa, which in spring rolled foamingly down the Rapids, bringing hills of ice and snow before them, were yet to be dreaded: they came in due season, crammed the waterway of the bridge to the parapet; but it defied their power—there it stands, and likely will for a length of time. It has been a model for several others, now constructed, with this difference, that *mortar* has been used in them. Strong examples will not do away with old habits; but it seems certain, that mortar, or cement, is of no use in rough arch-building.

Such is the detail of a concern that brought me both friends and enemies. There are situations in this life where a person will be blamed whether he act well or ill. I have always calculated on this, and have never been much disappointed, ever remaining regardless of receiving either praise or censure, acting to the best of my knowledge, and fortifying myself against abuse, misfortune, and flattery, whether the sun shines forth, or hides himself behind the clouds.

The following letter appeared in the public newspapers, when this bridge was built, from the pen, I believe, of Dr. Christie, who was once Editor of the Herald:

" Falls of the Chaudiere, 21st of February, 1827.

" SIR,

" AS a transient passenger brought here yesterday by the grand provincial object of attraction, the reported Rideau Canal, I witnessed an event to me no less interesting than novel, namely, striking the wooden supporters from under the first arch in the chain of bridges to be passed across the Falls of the Chaudiere. The time and circumstances led me to delay my journey for one day : this, then, was employed in making inquiries ; and the answer to these confirmed in my mind the importance of the imposing operation to which I had been an eye-witness. I find this beautiful arch was suggested by Lieutenant-Colonel By, of the Royal Engineers ; planned by Mr. Mactaggart ; and executed under the appropriate superintendence of Mr. M'Kay, of Montreal, architect. At the same time it ought not to be forgotten, that the important duty of striking the centres was entrusted to Mr. Drummond, architect. To all equal praise is due in their respective situations, for each and all have done their duty. Such has been the result of my inquiries on the spot. But there are other circumstances connected with this business equally deserving of notice to a passer-by. The bridge is one of the most beautiful specimens of rough

masonry in the continent of America ; it is built of stones hammer-dressed to the size of the arch : the work has been carried on in the depth of a Canadian winter, and during a season unusually severe,—an effort reflecting the highest credit on both the artificers and superintendents. During the evening, I was led to other reflections, to which the event I had witnessed naturally gave rise. This bridge on the Chaudiere is the only point where the two Provinces can be connected on their water boundary. This, therefore is a *solid* step to the union of the Provinces, a question long in agitation among our politicians. This bridge is one of communication with the Chaudiere Canal, a work which, when finished, will penetrate into the very centre of the Upper Province, and by this bridge will lead directly to the central point of the Lower. It will open up a fertile and rich country, for which generations yet unborn will gratefully thank the projectors, and applaud the memory of those who shall execute this great work.

“ Yours, &c.”

A chain-bridge over the *Big Kettle*, as proposed in the Report, was not sanctioned. A wooden one, of a peculiar construction, was to be made. Chains and cables, however, had to form the scaffolding ; in fact, a *chain-bridge* had to be thrown across,

before the wooden one could be erected. While the carpenters were at work on this scaffold one evening, the chains, which had been got over the gulf, snapped, and precipitated twelve of them into the awful cauldron; but as a number of boards fell with them, it fortunately happened, that while they laid hold of these, they were whirled round by the eddies to the little *rope-bridge* for passengers fixed below, by which means they were all miraculously extricated from their fearful situation, except one, who was probably entangled amongst the ropes and chains. It is singular, that one of these carpenters having put his *handsaw* beneath his arm before he fell, brought it out with him in the same situation, perfectly unconscious that it was there. This accident was always brought forward in the argument against chain-bridges being suitable for Canada, the frost being severe; but there was no frost at the time when these chains snapt, to have any contracting effect; the truth was, they were stretched by tension more than they could bear. Chain-bridges will answer in Canada as well as in England: the extremes of heat and cold are certainly much greater, but proper allowances can always be made to meet them; while iron does not corrode by rust to the twentieth part of the extent; the atmosphere

seems to contain no salt vapours. The *tin-tiled* churches remain for many years untainted, beaming in the rays of the sun with unsullied brightness.

My worthy friend Colonel By amused himself with the *Big Kettle*, after the former accidents. The cauldron kept so turbulent that no boats could live near it, so there seemed to be some difficulty in getting over the chains again; but he ingeniously planted a loaded cannon on the ledge, took a small rope, and, according to *Manby*, fired it sheer over the rocky island. Thicker ropes being attached to this, the chains were dragged over with the crabs, good strong iron cables from the naval store at Kingston, and on them he succeeded in raising a beautiful wooden-frame bridge: the view from which no pen can pourtray.

The whole bridging cost about 2500*l.* and afterwards became of great service to the Rideau Canal.

END OF THE FIRST VOLUME.

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